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 LAURA S. FLYNN, # 148511
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 San Francisco, California 94111-2584
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Attorneys for Defendant
 BAY AREA RAPID TRANSIT DISTRICT

UNITED STATES DISTRICT COURT
 NORTHERN DISTRICT OF CALIFORNIA

PATRICIA NASH,

Plaintiff,

vs.

BAY AREA RAPID TRANSIT DISTRICT, DOES
 1- 40,

Defendants.

NO. C 05 5307 VRW

**DECLARATION OF RICHARD
 WIECZOREK IN SUPPORT OF
 DEFENDANT'S MOTION FOR
 SUMMARY JUDGMENT, OR
 ALTERNATIVELY, PARTIAL
 SUMMARY JUDGMENT**

I, Richard Wieczorek, declare as follows:

1. I am the Manager for the Procurement Department with the Bay Area Rapid Transit District (BART), the defendant in this action. I have personal knowledge of the information contained below.

2. I have been employed by BART since 1992. From 1992 until 1994, I was a Contract Administrator within the Procurement Department. From 1994 to 1999, I was the Manager of Contract Administration. From 1999 to the present, I have been the Department Manager. As Department Manager, I oversee the divisions of Contract Administration; Purchasing; Logistics; and Inventory Management. As part of my duties I oversee car purchasing.

3. The BART systems includes 43 stations and three types of revenue vehicles. There are 137 A-Cars, 303 B-Cars, 150 C-Cars and 80 C2-Cars in the 670 car fleet. A-Cars have a fiberglass operator's cab, automatic train operating equipment, and two-way communications system. B-Cars

1 located in the middle of the train, do not have a cab nor do they control the operation of the train. C-
2 Cars are equipped with an operator's compartment, automatic train operating equipment and
3 communications system, as in the A-Car, and can function as a lead, middle or trailing car. They allow
4 flexibility to change train size without rerouting to a storage yard. C2-Cars represent the third generation
5 of BART cars. The C2-Cars have flip-up seats and vertical handrails on every other seat. The flip-up
6 seats, which are near each set of doors, were added to allow room for wheelchairs and customers with
7 bicycles. Blinking red lights near the doors warn hearing impaired riders that the doors are about to
8 close.

9 4. The number and kinds of cars that constitute a train varies, but an A-Car or C-Car must
10 be at each end of the train to provide the necessary automatic control equipment. The smallest BART
11 trains are three cars long, while the longest are ten.

12 5. In association with procuring new transit vehicles, BART goes through a complex and
13 lengthy process. Initially, the District's in-house licensed engineers prepare specifications which can
14 take six to twelve months to complete. The specifications are then sent to suppliers of transit vehicle
15 equipment for comments and suggestions. The bid package is then sent to an outside contractor for
16 review. Phase 1 of the actual procurement involves a review of the bid package; review of technical
17 specifications; contact with potential car builders; development of financing alternatives; and
18 finalization of procurement documents. Phase 2 involves request for proposals aka the letting of bids,
19 evaluation of the proposals for compliance with the requirements, ranking the proposals, determination
20 of proposals that are in the competitive range, competitive discussions, refinement of requirements, best
21 and final offers (BAFOs), evaluation of best and final offers, and recommendation of award.

22 6. The BART police report indicates that Ms. Nash's fell between a C Car (#439) and a C2-
23 Car (#2503). Based on my review of the documents relating to the procurement of the C2 Cars, it is my
24 understanding that work on preparation of the specifications began in or about mid 1989. On February
25 12, 1990, BART's Assistant General Manager Jim Gallagher routed the C-2 car specifications for
26 comment around the District. See, Exhibit A - San Francisco Bay Area Rapid Transit District -
27 Interoffice Communication. In August of 1990, a copy of the related specifications were sent out for
28 industry review to various car builders by M.F. Clapp, the Manager of BART's New Vehicle

1 Engineering Department. Exhibit B - Letters dated August 30, 1990 addressed to Kawasaki Rail Car,
2 Inc., Luminator, GEC Traction, Lea + Elliott, Inc., WABCO, Societe Europeenne C'Engrenages, and
3 Knorr Brake Corporation.

4 7. In May of 1991, Booz Allen Hamilton began reviewing the bid package. Booz Allen
5 Hamilton is a global engineering consulting firm which provides services to the transportation industry,
6 including passenger railways and urban transport which includes commuter rail, light rail, people movers
7 and monorails. The estimated cost associated with the support provided by Booz Allen for negotiating
8 the procurement was \$225,804. Exhibit C - BART Proposal by Booz Allen Hamilton, Inc.
9 Transportation Consulting Division. and related Support Schedule. In July 1991, meetings were held
10 with potential car builders to discuss their capabilities, interest, etc. Exhibit D - Memorandum dated
11 July 15, 1991 regarding Meetings with Potential Car Builders..

12 8. The Contract Book - Technical Provisions for the Procurement of Transit Vehicles was
13 completed in August 1991. Exhibit E. Pursuant to a Notice to Suppliers Requesting Proposals, a
14 solicitation for bids was advertised on August 1, 1991. Exhibit F - San Francisco Bay Area Rapid Transit
15 District Notice to Suppliers Requesting Proposals. The solicitation for bids stated that all work
16 performed should be performed in accordance with the Laws of the State of California. A pre-proposal
17 conference was held on August 28, 1991 to explain the procurement and answer questions of parties
18 interested in contracting for the work. The original proposal due date was October 1, 1991. Changes to
19 the Contract Book were made on October 8, 1991, October 25, 1991, and November 18, 1991. Exhibit
20 G - Letters re Contract Number 42DA-110.

21 9. Proposals were received from Morrison-Knudsen, C.Itoh/Kinki-Sharyo and
22 Mitsui/Kawasaki on December 10, 1991. Technical proposals were evaluated by a technical evaluation
23 committee and price proposals were evaluated by a separate price evaluation committee. The evaluation
24 of proposals (Round 1) was completed on December 30, 1991. Exhibit H - Executive Decision
25 Document.

26 10. A Request for Best and Final Offer was issued on February 20, 1992. Exhibit I - Letter
27 from BART Deputy General Manager Richard While to Thomas Smith, President of Morrison Knudsen
28 Corp. dated February 20, 1992. Best and Final Offers were received March 2, 1992 and technical and

1 price evaluations were completed on the same day. Evaluation of the Best and Final Offers was
2 completed and Morrison-Knudsen ranked the highest. Exhibit H - Executive Decision Document. On
3 March 17, 1992, the Board of Directors authorized the General Manager to award the Contract to
4 Morrison Knudsen Corporation. Exhibit H, Exhibit J - Letter dated March 18, 1992 from Eldridge
5 Johns, Jr. Contract Manager to all bidders. The Contract was executed on May 4, 1992. Exhibit K - San
6 Francisco Bay Area Rapid Transit District Contract.

7 11. BART is in the process of developing a new car specification. At this time, the intent is
8 for the new specifications to require 3 door pairs per side of the vehicle. With such a design, doors on
9 the new cars will not match the location of door-stop locations on the existing cars.

10 12. Attached as Exhibit L are true and correct copies of as-built plans for the construction of
11 the platform of the 16th Street & Mission station in San Francisco. These plans are records kept in the
12 ordinary course of business by BART. The plans provide the floor plan from multiple perspectives, as
13 well as how the platform interfaces with the tracks. These plans were prepared by Tudor Engineering
14 Company and approved by project director Persons-Brinckerhoff-Tudor-Bechtel and BART's Director
15 of Development and Engineering in 1970 - signifying that the plans are a reasonable design.

16 I declare under penalty of perjury under the laws of the State of California that the foregoing is
17 true and correct. Executed this 13TH day of February 2008 in Oakland, California.

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RICHARD WIECZOREK

EXHIBIT "A"

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

INTEROFFICE COMMUNICATION

DATE: February 12, 1990

TO: Distribution

FROM: James T. Gallagher, Assistant General Manager - Operations

SUBJECT: Specifications For New Transit Vehicles

The District has started an effort to prepare specifications for procuring new transit vehicles. The present C-Car procurement specifications will be updated with the necessary changes.

I request any input from you or your staff to improve the present C-Car specifications. Please provide this input by March 2, 1990.

JTG:KVH:W/KVH-067

Distribution

B. Hynes-Cherin
R. Weule
L. Williams
S. Wakeman

cc: W. Fleisher
V. Mahon
F. Stephens

EXHIBIT “B”

August 30, 1990
TGE-044-90

Kawasaki Rail Car, Inc.
One Larkin Plaza
Yonkers, New York 10701

Attention: K. Kondo, Marketing Manager

SUBJECT: PROCUREMENT of NEW TRANSIT VEHICLES

The District has determined a need to procure 70 - 200 new transit vehicles due to patronage growth for the existing system and for the planned extensions to the system.

The District has updated it's present C-car specifications to represent possible configuration of future C and B-cars purchased by competitive low bid procurement. However, it is anticipated that the General Provisions will be revised for a negotiated procurement.

As a supplier of transit vehicle equipment the District is sincerely interested in your comments and suggestions to the enclosed specification.

This Specification is for "INDUSTRY REVIEW ONLY" and contains Supplier references and part numbers that will not be contained in the official RFP or RFQ issued later, thus providing considerable latitude in submitting proposals.

Please provide any suggestions or comments by September 29, 1990 to:

R J Grimes
Vehicle Systems Engineer
BAY AREA RAPID TRANSIT DISTRICT
MS OHY 225
150 Sandoval Way
Hayward, CA 94544
(415) 475-2171

Thank you for your assistance

Very truly yours,

M. F. Clapp, Manager
New Vehicle Engineering

MFC/RJG/mjm

Enclosure

August 23, 1990
TGE-044-90

Luminator
P. O. Box 278
Plano, Texas 75074

Attention: James W. Young

SUBJECT: PROCUREMENT of NEW TRANSIT VEHICLES

The District has determined a need to procure 70 - 200 new transit vehicles due to patronage growth for the existing system and for the planned extensions to the system.

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Vehicle Systems Engineer
BAY AREA RAPID TRANSIT DISTRICT
MS OHY 225
150 Sandoval Way
Hayward, CA 94544
(415) 475-2171

Thank you for your assistance

Very truly yours,

M. F. Clapp, Manager
New Vehicle Engineering

MFC/RJG/mjm

Enclosure

August 28, 1990
TGE-044-90

GEC Traction
P. O. Box 134
Manchester M701AH U.K.

Attention: Malcolm Hawitt, Contract Manager

SUBJECT: PROCUREMENT of NEW TRANSIT VEHICLES

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Vehicle Systems Engineer
BAY AREA RAPID TRANSIT DISTRICT
MS OHY 225
150 Sandoval Way
Hayward, CA 94544
(415) 475-2171

Thank you for your assistance

Very truly yours,

M. F. Clapp, Manager
New Vehicle Engineering

MFC/RJG/mjm

Enclosure

August 23, 1990
TGE-044-90

Lea + Elliott, Inc.
14325 Willard Rd., Suite 200
Chantilly, Virginia 22021

Attention: Wolfgang Bamberg

SUBJECT: PROCUREMENT of NEW TRANSIT VEHICLES

The District has determined a need to procure 70 - 200 new transit vehicles due to patronage growth for the existing system and for the planned extensions to the system.

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R J Grimes
Vehicle Systems Engineer
BAY AREA RAPID TRANSIT DISTRICT
MS OHY 225
150 Sandoval Way
Hayward, CA 94544
(415) 475-2171

Thank you for your assistance

Very truly yours,

M. F. Clapp, Manager
New Vehicle Engineering

MFC/RJG/mjm

Enclosure

August 23, 1990
TGE-044-90

WABCO
P. O. Box 11
Spartanburg, S. C. 29304-0011

Attention: J. White, Manager

SUBJECT: PROCUREMENT of NEW TRANSIT VEHICLES

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Please provide any suggestions or comments by September 29, 1990 to:

R J Grimes
Vehicle Systems Engineer
BAY AREA RAPID TRANSIT DISTRICT
MS OHY 225
150 Sandoval Way
Hayward, CA 94544
(415) 475-2171

Thank you for your assistance

Very truly yours,

M. F. Clapp, Manager
New Vehicle Engineering

MFC/RJG/mjm

Enclosure

August 10, 1990
TGE-042-90

Societe Europeenne D'Engrenages
26 Redondo Ct.
St. Helena, CA 94574

Attention: Stuart Walters

SUBJECT: PROCUREMENT of NEW TRANSIT VEHICLES

The District has determined a need to procure 70 - 200 new transit vehicles due to patronage growth for the existing system and for the planned extensions to the system.

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As a supplier of transit vehicle equipment the District is sincerely interested in your comments and suggestions to the enclosed specification.

This Specification is for "INDUSTRY REVIEW ONLY" and contains Supplier references and part numbers that will not be contained in the official RFP or RFQ issued later, thus providing considerable latitude in submitting proposals.

Please provide any suggestions or comments to:

R J Grimes
Vehicle Systems Engineer
BAY AREA RAPID TRANSIT DISTRICT
MS OHY 225
150 Sandoval Way
Hayward, CA 94544
(415) 475-2171

Thank you for your assistance

Very truly yours,

M. F. Clapp, Manager
New Vehicle Engineering

MFC/RJG/mjm

Enclosure

cc: K. V. Hari
R J Grimes

0830

August 10, 1990
TGE-042-90

Knorr Brake Corporation
P. O. Box 1905
Rockville, MC 20850-0905

Attention: Paul C. Akins

SUBJECT: PROCUREMENT of NEW TRANSIT VEHICLES

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Please provide any suggestions or comments to:

R J Grimes
Vehicle Systems Engineer
BAY AREA RAPID TRANSIT DISTRICT
MS OHY 225
150 Sandoval Way
Hayward, CA 94544
(415) 475-2171

Thank you for your assistance

Very truly yours,

M. F. Clapp, Manager
New Vehicle Engineering

MFC/RJG/mjm

Enclosure

0831

EXHIBIT "C"

BART PROPOSAL
BOOZ-ALLEN & HAMILTON Inc.
TRANSPORTATION CONSULTING DIVISION

Job Title: Negotiated Procurement Support
 Job Number:
 Start Date:
 Ending Date:
 Contract Type:

LABOR COST SUMMARY:

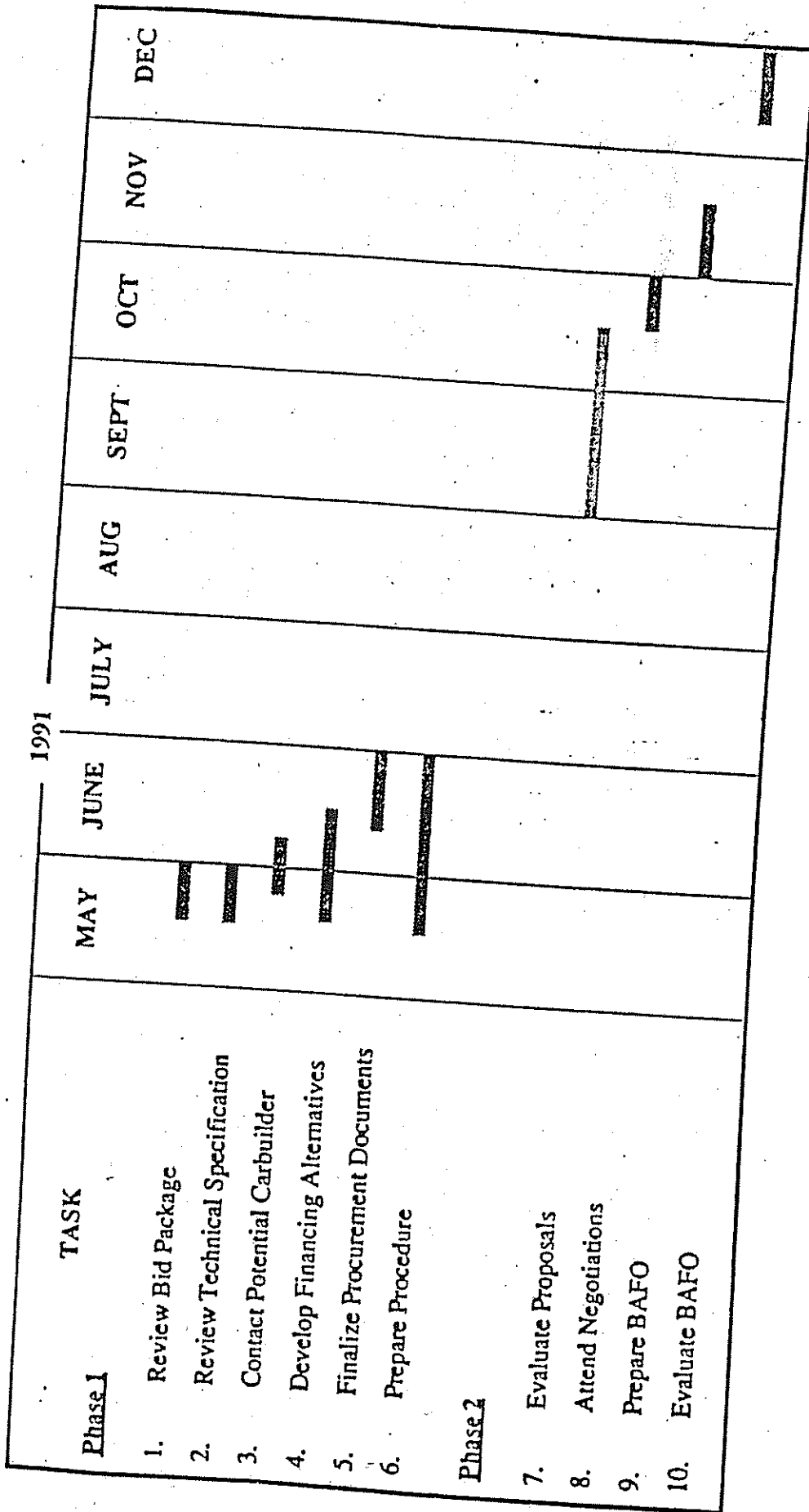
NAME	LOADED RATE	TASK 1	TASK 2	TASK 3	TASK 4	TASK 5	TASK 6	TASK 7	TASK 8	TASK 9	TASK 10	TOTAL HOURS	TOTAL COST
Wing	238.5	-	-	-	6	6	-	6	-	-	-	18	4,293
McDonald	160.8	8	24	40	20	30	20	40	40	24	16	262	42,130
Rodda	117.7	20	20	-	-	30	20	20	20	-	-	130	15,301
Salamah	149	-	-	40	40	20	-	20	-	20	-	140	20,860
Kriens	104.3	-	20	-	-	-	-	40	60	-	-	120	12,516
Strong	97.6	20	0	-	20	-	40	-	-	24	16	120	11,712
Bramley	56.6	20	20	40	40	60	40	80	80	80	40	500	28,300
Winner	152.3	8	8	-	80	-	-	24	-	-	-	120	18,276
Support	35.8	-	8	-	-	60	40	-	-	-	-	108	3,866
Virginkar	85	40	-	-	-	40	40	80	80	80	70	430	36,550
TOTAL HOURS		116	100	120	206	246	200	310	280	228	142	1,948	193,804

COST SUMMARY	
LABOR - BA&H	157,254
LABOR - SUBS	36,550
TRAVEL - BA&H	29,000
TRAVEL - SUBS	3,000
TOTAL	225,804

Ref:TC04.13BART-Neg Procurement 2

5/15/91

BART NEGOTIATED PROCUREMENT SUPPORT SCHEDULE



Ref: TCD4.4.BART Schedule.d

May 15, 1991

EXHIBIT “D”

Altura, Nelson & Co.
Incorporated

Haley
Gallagher

Copies to

Chapp
Vickland
Bill Thomas
Dave Hammer

18 Crow Canyon Court, Suite 350
San Ramon, California 94583
(415) 831-0600
Telecopier: (415) 831-0823

MEMORANDUM

TO: Kris Hari
FROM: Dennis Ciocca *Dennis Ciocca*
RE: Meetings with Potential Car Builders
DATE: July 15, 1991

RECEIVED

JUL 16 1991

C&C

The following paragraphs summarize my notes from our meetings with Potential Car Builders during the week of July 8. My comments are limited to financial elements or questions raised in the meetings.

1. Bombardier (July 9, 9:00 a.m.) - Bombardier subcontracted construction of the 62-A subway car from Kawasaki for New York City Transit. During the break, Gary Hillman told me that their financing proposal played a major role in obtaining the NYC contract but he was not willing to elaborate on the details. He indicated that they would aggressively pursue the financing proposal.
2. ABB (July 9, 3:00 p.m.) - Todd Welty explained that ABB has a finance arm which has been involved in their projects with N.J. Transit and SEPTA. He further explained that ABB Finance is interested in the BART Project, but does not deal in tax exempt finance. However, it does not appear that ABB will be a project bidder due to problems with the propulsion system specifications.
3. UTDC (July 10, 9:00 a.m.) - UTDC had made extensive preparations for the meeting, including written comments on the Draft Financing Proposal. From the questions raised at the meeting and the written submission, UTDC is obviously experienced with transit financing and tax exempt securities. They have discussed the interesting concept of providing credit enhancement (particularly during construction) through the Canadian Export Development Corp., a AAA rated agency.
4. AEG - Westinghouse (July 11, 9:00 a.m.) - Terry Sanders is obviously familiar with BART but probably won't bid as a prime contractor since Westinghouse parts are virtually required in the specs. The company does not seem familiar with tax exempt finance but is probably good at cross border leasing.

Altura, Nelson & Co.

Incorporated

Kris Hari

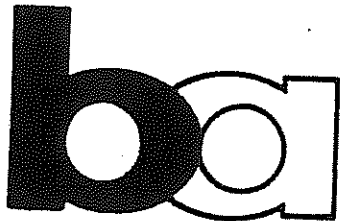
July 15, 1991

Page 2

5. Morrison-Knudsen (July 11, 2:00 p.m.) - MK seems to have some domestic experience with the financing of transit vehicles (particularly locomotives) but does not appear to have funded a similar subway vehicle program. They mentioned working with Alternative Concepts of Boston to fund tax exempt programs.
6. C.Itoh/Kinkisharyo (July 12, 9:00 a.m.) - This was the only firm to bring their own in-house financing specialist, Steve Nagy of Xitech (a C.Itoh subsidiary). Xitech has a San Francisco office and I expect to hear from them in the future. Xitech does both domestic and international financing and has previously submitted a cross border lease proposal to BART. Steve was formerly finance director at MBTA in Boston.
7. Kawasaki (July 12, 2:00 p.m.) - This was the only potential vendor to arrive solely with foreign based personnel. They were involved in the financing of 75 vehicles for MBTA but did not specify their exact participation. Kawasaki retained the law firm of Hale and Dorr of Boston (which has a municipal bond specialty group) to represent them on the MBTA transactions.

EXHIBIT "E"

**SAN FRANCISCO BAY AREA RAPID
TRANSIT DISTRICT**



CONTRACT BOOK

**TECHNICAL PROVISIONS
FOR THE PROCUREMENT OF
TRANSIT VEHICLES**

AUGUST 1991

INCLUDES ADDENDUM 1-6 1/92

MODIFICATION No.1 2/92

CONFORMED 5/92

**CONTRACT NO.42DA-110
VOLUME 3**

CONFORMED

A black rectangular redaction mark is located at the bottom right of the page, below the word 'CONFORMED'.

SECTION 3

CAR BODY

3.01 DESCRIPTION

A. This section specifies the requirements for each car body.

B. **Definitions:** Car body includes basic structural shell, including floor framing, roof and wall framing, supports for trucks, supports for equipment, exterior sheathing for roof and walls, floor deck, insulation, interior, windows, carpeting, seats, stanchions, handrails, grab-handles, crew steps, doors, and intercar closures.

C. **Interior Arrangement:** Arrangement of seats, windscreen, stanchions, and handrails in cars shall be as shown on Contract Drawings.

3.02 CITED REFERENCES

A. USGPO - United States Government Printing Office

1. FMVSS 222: Federal Motor Vehicle Safety Standard, as published in Federal Register, Volume 41, Number 19, January 28, 1976.

B. Munsell Color

1. Munsell Neutral Value Scale

C. NEMA - National Electrical Manufacturers Association

1. 250: Enclosures for Electrical Equipment (1000V maximum)

3.03 SUBMITTALS

A. **Mock-Up Requirements:**

1. General:

a. Provide mock-ups that show conformance to maintainability and human factors requirements herein. Approved mock-ups shall be of dimensions, colors, textures, methods of construction, and workmanship as specified in this Contract.

b. **Scheduling Requirements:**

1) **Underfloor Mock-Up:** Mock-ups shall be provided prior to Design Review number 2 and before design of equipment enclosures and selection of enclosure and equipment locations.

2) **Cab and Seat Mock-Ups:** Mock-ups shall be approved by the District prior to actual production and installation of equipment in cars.

c. Mock-ups shall not be required where components and assemblies are installed in the same configuration and are completely interchangeable with same components and assemblies and are physically identical to the components

currently installed on District C-cars purchased under contract 42AA-110.

2. **Cab Mock-Up:**

a. **Number and Scale:** Provide full-scale mock-up of full width cab including passenger area wall.

b. **Mock-Up Requirements:** Provide mock-up showing train operator controls, signs, seat, and comfort equipment.

3. **Underfloor Mock-Up:**

a. **Scale:** Provide full-scale mock-up of underfloor arrangement of car.

b. **Mock-Up Requirements:** Provide mock-up showing location of underfloor mounted equipment, including ducts for air conditioning, raceways, sufficient truck equipment to show appropriate clearances, access, and other design requirements.

4. **Seat Mock-Ups:**

a. **Number and Scale:** Provide one each full-scale mock up of proposed operator and passenger seats.

b. **Mock-Up Requirements:**

1) Provide mock-up showing seats in complete detail.

2) At time of submittal of mock-up, submit samples of materials used in construction of seats.

B. **Samples:**

1. **General:** Submit minimum twelve-by-six-inch samples of interior and exterior finish materials in accordance with quantity and other requirements following for approval of colors and color ranges, textures, and physical properties:

a. **Interior:** Three samples of each different color and texture.

b. **Exterior:** Two samples of each different type material. Samples shall include welds or fasteners if they are used in body shell construction.

C. **Structural Analysis:**

1. Provide analyses as indicated in Section 16, entitled "MANAGEMENT SYSTEMS," herein.

2. **Collision:**

a. Provide analysis of manner of failure under conditions of extreme end loading and minimum loading initiating such failures, including analysis of interlocking of longitudinal members of cars or other means to prevent telescoping and jackknifing of cars. Additionally, include conditions of impact as specified in this Section.

b. Provide discussion of what would happen to car structural features such as seats and handrails.

3. Deflections and Frequencies:

a. Tabulate deflections and natural frequencies of car body under each indicated vertical load condition.

b. Provide calculations showing following:

1) Deflection of car structure under cantilevered seat and floor loads. Additionally, these calculations shall show deflections of side framing and principal transverse members such as cross-bearers, bolsters, and end sills.

2) Longitudinal shortening of car structure between bolsters and between end sills under statically resistant end loads applied at center of end sill, and lateral and vertical deflection of car body structure under this loading.

3) That car body frequencies are not coupled with frequencies of truck and that combination of car body and truck frequencies shall not couple with aerial structural frequency as specified in Section 2, entitled "SYSTEM REQUIREMENTS," herein.

3.04 INTERFACE REQUIREMENTS

A. General: Cars provided shall comply with following requirements with respect to the District's existing B-cars and C-cars.

1. Car bodies shall be similar in appearance and provide collision characteristics (acceleration and energy absorption) compatible with existing B-car and C-car types. Refer to Article 3.05, entitled "CONSTRUCTION," Sub-Article 3.05E, entitled "Crashworthiness Criteria," herein.

2. Walkways and intercar closures shall function physically like those of existing B-car and C-car types and as shown on Contract Drawings.

B. Seat Assembly

1. Seat assembly, cushions and frames shall be completely interchangeable with Teperman P/N 129-0541-000-0, -0542-, -0543-, -0544-, -0545-, -0546- seat assemblies, cushions, and frames used on District C-cars purchased under Contract 42AA-110 and as shown on Contract Drawings.

C. Side Doors shall be as shown on Contract Drawings.

D. Closure Requirements: Closure shall interface and be completely functional and compatible with the District's existing intercar closures.

E. Anticlimber and Closure Buffer Faceplates: Anticlimbers and buffer face plates shall be provided on both ends of all cars and shall be completely functional and compatible with the District's existing cars.

F. Glass: Glass shall be as shown on Contract Drawings.

3.05 CONSTRUCTION

A. General:

1. Car Body: Each car body shall:

a. Be designed to carry specified loads.

b. Be structurally similar to existing vehicles to form an integrated structure capable of resisting, without permanent set of principal structural members and without other detrimental or destructive deformations, loads and stresses inherent in type of service anticipated.

c. Be constructed and assembled in accordance with general arrangement and dimensions indicated.

d. Be welded, mechanically fastened, or bonded structure, or combination of aforementioned, consisting of longitudinal extruded members, vertical stiffeners and other items similar to existing vehicles.

e. Have sheathing of aluminum.

f. Be watertight, including installed windows and doors.

g. Be designed for minimum fatigue life of 20 years.

2. Car Frame: Each car frame shall:

a. Have framing structure designed to carry normal loads efficiently and to provide cars which shall, under conditions indicated, dissipate energy of impact without leaving trackway or overriding. This shall be accomplished with least possible shock and with maximum plastic deformation at ends. (Refer to Sub-Article 3.05E, entitled "Crashworthiness Criteria," herein.)

b. Be constructed of aluminum or other materials as deemed necessary by the Supplier to provide compliance with operational requirements of Section 2, entitled "SYSTEM REQUIREMENTS" herein.

3. End Underframe Units: Units consisting of body bolster, draft sill, and end sill shall be fabricated of aluminum or low-alloy high-tensile steel and contain adequate drain holes in cavities.

B. Vertical Loading: Vertical load of AW3, with live load uniformly applied to seat frames and standing area of floor deck, shall not cause stress level in any structural member to exceed 50 percent of yield stress for material used.

C. Camber:

1. Car bodies may be built with positive camber.

2. Under any design approach, car structures and car-mounted equipment shall not violate clearance envelopes.

D. Compression Loading (Buff Loading):

1. Static compressive end load equal to three times AW0 acting along vehicle body longitudinal centerline and distributed about center one-third of end sill shall not cause any permanent deformation of any part of car body structure when combined with vertical load of AW3 minus AW0.

2. Cantilevered seat loads shall be applied to side walls, with remainder of vertical load applied uniformly over standee area of car floor.

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3. Combined stresses due to loading conditions specified in Article 3.06, entitled "UNDERFRAME," Sub-Article 3.06D, entitled "Truck Connection to Car Body," shall not exceed 90 percent of yield value of structural materials.

4. Vehicle body shall be tested for combined load condition in Sub-Articles 3.05D.1 and 3.05D.2 above and tested or analytically checked for condition specified in Sub-Article 3.05D.3 above.

E. Crashworthiness Criteria:

1. Cars shall have capability to dissipate energy of impact without leaving track or overriding on tangent track.

2. Cars shall be structurally designed to be compatible with the acceleration, deflection, and energy absorbing characteristics of the District's existing cars. Figures 3-1 through 3-6, represent two-car consist and four-car consist impacting same size consist standing still. Additionally, to be compatible with existing cars, transfer of energy has to take place through anticlimber and end sills.

NOTICE

The survivability of the BART vehicle is based on controlled progressive failure with the maximum energy absorbed in bending and crushing the ends of the colliding cars up to the bulkhead separating the attendant's area from the passenger area. Additional energy is absorbed in the collapsing of the couplers and deformation of the ends of following cars before serious damage to the passenger area of the lead car is acceptable.

3. Crashworthiness Analysis:

a. Provide analyses using consists with only C-type cars in accordance with following requirements:

1) To determine expected extent of any damages, provide analysis (assume that couplers on colliding cars do not mate) showing results of:

a) Four-car consist traveling at 40 miles per hour striking standing (brakes locked) four-car consist with each car at AWI.

b) Two-car consist traveling at 40 miles per hour striking standing (brakes locked) two-car consist with each car at AW0.

2) To determine expected extent of any damages while operating in yard at AW0, provide analysis showing result of cars traveling at 10 miles per hour and impacting with couplers mating and not mating:

a) Cab end into cab (brakes locked).

b) Cab end into non-cab end (brakes locked).

c) Non-cab end into non-cab end (brakes locked).

F. Hoisting and Jacking**1. Hoisting:**

a. Provide four hoisting connections at symmetrical locations at the edge of roof as shown on Contract Drawings.

b. Provide means to attach removable hoisting lugs. Sockets shall have renewable threads. Socket Threads shall be 1-1/2 - 6 UNRC - 2A.

c. Any holes provided shall have means to prevent collection of moisture and be provided with drain holes, plugs, or some other suitable arrangement. Any removed parts will be attached to car with suitable tether.

d. Provide hoisting points which, when used together as group, shall make it possible to lift empty car weight, including trucks, at design level of 50 percent of yield.

2. Jacking:

a. Eight jacking pads shall be provided, one at each corner and one near each bolster inboard of truck attach points on both sides of cars as shown on Contract Drawings.

b. Each jacking pad shall be capable of supporting one half of weight of complete car and capable of restraining force in horizontal plane equivalent to 1/8 of weight of complete car without permanently deforming or damaging car body.

c. Pads shall have an alignment hole in center of pad and have three sided guard to provide anti-slip feature and be readily accessible for use by removing only the adjacent skirt section but no other car element.

d. Vehicle body shall be capable of resisting torsional and bending loads caused by any jacking condition, including diagonal jacking at two of most adversely opposing jacking pads, without suffering any permanent deformation or damage.

3.06 UNDERFRAME**A. General:**

1. Underframe shall consist of structural assembly on which floor is mounted and to which sides, ends, trucks, and couplers are attached.

2. Underframe shall be designed to function integrally with other car body elements in resisting design loads.

3. Underframe structure shall be painted an approved gray Munsell Neutral Value Scale N6/30.0 %R in accordance with the requirements of Section 19, entitled "MATERIALS AND WORKMANSHIP," herein with a durable gloss paint approved by Project Director.

B. End Underframe:**1. General:**

a. End underframe shall consist of end sill, draft sill, and body bolster.

b. Assembly shall act as an integral unit to transfer loads generated at anticlimber, coupler, and truck interfaces.

c. Design shall provide for load path continuity at joints.

2. End Sill:

a. End sill structure shall be mating structure between anticlimber feature and draft sill for transfer of collision loads.

b. Together with end frame structure, end sill structure shall be capable of carrying, without permanent deformation, minimum 40,000-pound vertical load acting upward or downward, as well as specified buff loads.

3. Draft Sill:

a. Draft sill structure shall be designed to react to buff and draft loads induced by coupler-draft gear unit as specified in Section 4, entitled "COUPLER AND DRAFT GEAR," herein, in addition to any vertical loads induced by anticlimber feature.

b. No damage or permanent deformation shall result from any loading up to load which activates emergency release feature specified in Section 4, entitled "COUPLER AND DRAFT GEAR," herein.

4. Body Bolster:

a. Body bolster shall be structure capable of transferring loads passing between trucks and car body, and shall function integrally with other body elements in resisting design loads.

C. Anticlimber:

1. Anticlimber shall be mechanically fastened to end sills at X and Y-ends of cars as shown on Contract Drawings.

2. Under collision conditions each anticlimber shall mate with opposing anticlimber to prevent one car from climbing over other car. Additionally, no structural deformation or slippage shall occur under vertical load of 40,000 pounds minimum acting upward or downward, combined with longitudinal compression load three times AW0. Structure design shall allow end sill yield prior to failure of the anticlimber or attachment.

3. Anticlimbers shall be constructed of same material as car body or end underframe.

4. Anticlimber shall interface and prevent climbing under conditions as specified herein while mating and comply with applicable requirements of Article 3.04, entitled "INTERFACE REQUIREMENTS," herein.

D. Truck Connection to Car Body:

1. Connection between car body and trucks shall be such that trucks shall be raised with car body, unless intentionally detached.

2. Connection shall provide adequate strength to resist shock loads as specified for car mounted equipment.

3. Connection shall meet the requirements specified in Section 11, entitled "TRUCKS AND SUSPENSION," Article 11.07, entitled "STRENGTH REQUIREMENTS," herein.

4. Provide electrical isolation to meet requirements of Article 9.18, entitled "BONDING AND GROUNDING," herein.

5. Positive stops shall be provided to limit vertical and transverse movement of trucks.

6. Shall interface with trucks from existing cars to allow fleet interchangeability of trucks.

E. Underfloor:

1. Underfloor shall consist of cross members and floor deck cross bearers (lateral beams) or longitudinal extrusions, which tie securely to side members to form basic framing for support of floor deck and underfloor equipment units.

2. Supplementary beams and intercostals shall be used as required for equipment supports and floor deflection requirements.

3. Primary loads on the underfloor shall be the vertical loads created by passenger, floor, and interior item weights, together with specific underfloor equipment loads.

4. Underfloor at ends of car shall be designed for crash worthiness requirements.

5. Vertical, lateral, and longitudinal acceleration load conditions shall not exceed those specified in Section 2, entitled "SYSTEM REQUIREMENTS," herein.

3.07 BODY SHELL

A. General:

1. Body shell shall include sides, roof, and end assemblies mounted to underfloor and frame.

2. Visible surfaces shall have similar finishes and surface texture to match that of existing District A, B & C cars.

a. Mechanical finish on aluminum parts shall be per Aluminum Association #45, M33 Course Satin finish.

3. Side and roof surfaces shall not be damaged when passing through high-velocity jet-type or rotary-brush-type automatic car washer.

B. Sides:

1. General:

a. Body shall consist of external sheathing, vertical framing members, and longitudinal members.

b. Side construction shall utilize extruded panel sections and members.

c. Sidewalls shall provide adequate space (area) for air distribution ducts as determined by the Supplier.

2. Loads: Side structure shall be designed to withstand loadings induced by vertical bending effects, vehicle body compression, vehicle jacking, and cantilever-seat effects.

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3. Reinforcement: Deflections shall be limited to prevent door movement from being restricted and window glazing from coming loose, being damaged, or leaking under environmental and loading conditions as specified in these specifications.

4. Flatness:

a. Side material and manufacturing method shall ensure uniform flatness along vehicle.

b. Car side longitudinal waviness shall not exceed plus or minus 1/600 of the span between adjacent vertical members. More than one node between adjacent vertical members shall not be allowed.

c. If sidewalls are welded surface welds shall be hidden by sidewall features. Sidewall to vertical post welds shall be designed far enough away from surface to prevent dimpling.

d. Side wall waviness caused by welding shall be precluded by design or completely eliminated after fabrication.

C. Roofs:

1. Car roof framing shall consist of carlines with appropriate longitudinal members, all suitably fastened to obtain an integrated structure of adequate strength and rigidity.

2. Roof framing members shall be designed and positioned to permit fastening of roof wiring, lighting fixtures, handholds, stanchions, and speakers for public address.

3. Roof structure shall be capable of withstanding without damages load generated by 300-pound person walking on roof.

4. Rain gutters shall be installed on roof in such manner as to preclude water draining over passenger side doors, cab windows, end doors or flipper doors. Additionally, aforementioned requirement shall also apply when train is accelerating or decelerating.

5. Rain gutters shall drain completely when car is standing on level track.

a. Rain gutters at Y-end shall stop at cab on C-car and provisions for draining shall be provided for by drain tubes with screens to prevent clogging to undercar.

b. Rain gutters on C-car X-end and B-car X & Y-end shall extend 3/4" past end wall to preclude water draining down end walls.

D. Ends: Car ends shall be designed to transfer loads specified and shall comply with exterior and interior conformance as shown on Contract Drawings.

3.08 INSULATION

A. Provide thermal insulation integrated with car structure complying with overall thermal requirements as specified in Section 7, entitled "HEATING, VENTILATING, AND AIR CONDITIONING," herein.

B. Provide acoustical insulation applied where necessary to comply with noise and vibration requirements of Section 2, entitled "SYSTEM REQUIREMENTS," herein.

C. Provide materials complying with requirements of Section 19, entitled "MATERIALS AND WORKMANSHIP," herein.

D. Secure rigid and nonrigid preformed insulation with mechanical fasteners or fire-resistive adhesives, or both.

3.09 FLOORS

A. General:

1. Floors shall include deck on which interior covering is laid and longitudinal extrusions which are attached to underframe structure.

2. Floors shall be designed such that no permanent deformation shall occur during life of each car.

B. Floor Decks:

1. Floor decks shall be:

a. Designed to withstand dead load plus passenger load of 80 pounds per square foot.

b. Designed such that vertical deflection shall be limited to 1/360 of short span.

c. Made up of panels of size that can be interchangeable with floor panels used on District C-cars purchased under Contract 42AA-110.

d. Comply with fire resistive requirements of Section 19, entitled "MATERIALS AND WORKMANSHIP," herein.

2. Deck panels shall be fastened to longitudinal extrusions to prevent squeaking, chafing, and horizontal and vertical movement between adjacent surfaces.

3. Assembled floor deck shall be level and flat except for design camber, with upper surface free from indentations.

4. Exposed edges of floor, including openings for ducts, conduits, and joints between floor sections, shall be sealed.

5. Openings in floor shall be minimized. Any holes shall be fitted with protective covers or another fire barrier system capable of providing resistance to penetration of fire at least equal to basic floor.

6. Washing solutions used in carpet cleaning shall not enter at joints of floor or at wall bases.

3.10 C-CAR OPERATING CAB

A. General: C-cars shall have an operating cab at Y-end, with train operator's console located as shown on Contract Drawings.

B. Configuration:

1. Cabs shall be full width of car.

2. When in mid-train position, cab door shall close off console area to passengers and remainder of cab area shall be available to standing passengers.

3. Equipment located in areas where window and door opening expose equipment to external elements shall be protected.

C. Equipment:

1. Cab equipment shall be as indicated and as approved on cab mock-up.

3.11 UNDERFLOOR

A. General:

1. Underfloor equipment shall be arranged as approved on underfloor mock-up.

2. Equipment requiring inspection shall conform with maintainability requirements of Section 15, entitled "SYSTEM SUPPORT," herein.

3. Underfloor equipment and structure shall be painted an approved gray Munsell Neutral Value Scale N/630.02R color in accordance with the requirements of Section 19, entitled "MATERIALS AND WORKMANSHIP," herein with a durable glass paint approved by Project Director.

4. Where grounding straps are required, connection shall be made of compatible materials.

B. Design:

1. Mounting Requirements:

a. Equipment supported on resilient mounts shall be designed to achieve positive retention above clearance line in event of failure of resilient elements.

b. Underfloor Bolts in Tension may be utilized with approval of the Project Director.

c. Mounting bolts shall have self-locking nuts and secondary retention device on bolts.

d. Failure of any single mount shall not allow equipment to drop below clearance envelope.

e. Design shall be, at a minimum, for the following loads:

- 1) Vertical load, 3G
- 2) Longitudinal load 5G, plus vertical load 1G
- 3) Transversal load 3G, plus vertical load 1G

C. Enclosures:

1. Enclosures shall be designed such that assemblage of equipment and enclosure is waterproof.

2. Boxes shall be designed to protect equipment from under floor environmental conditions.

3. Interior of each box, except battery box, shall be painted white in accordance with requirements of Section 19, entitled "MATERIALS AND WORKMANSHIP," herein.

4. Hardware used to secure doors and access covers on under floor boxes and enclosures shall comply with material requirements of Section 19, entitled "MATERIALS AND WORKMANSHIP," and environmental requirements of Section 2, entitled "SYSTEM REQUIREMENTS," herein and shall include secondary retention or failsafe design.

a. All cover securement hardware, except battery box, shall be identical and interchangeable.

5. Covers:

a. Covers on underfloor boxes shall be interchangeable between like boxes on different cars and, to extent possible, between boxes on same car.

b. Battery box covers may be fiberglass, provided they comply with fire-resistive requirements of Section 19, entitled "MATERIALS AND WORKMANSHIP," herein.

c. Removable covers shall have two-inch-wide reflective tape on both sides visible in headlights and be provided with permanent car numbers on exterior.

6. Battery Box shall be steel or fire resistive fiberglass complying with the requirements of Section 19, entitled "MATERIALS AND WORKMANSHIP," herein, shall be oversize with universal hold down brackets to accommodate batteries of various manufacturers and shall be arranged that each cell is accessible for inspection and watering from side or under car. Additionally, box shall have adequate ventilation and drainage.

D. ~~Raceways~~: Provide covered raceways complying with material requirements of Section 19, entitled "MATERIALS AND WORKMANSHIP," herein.

3.12 INTERIOR

A. Floor Covering:

1. Wool carpeting and foam underlayment pads shall be installed to cover floor areas of passenger sections and train operator area.

2. Metal trim strip for carpet shall be installed in such a manner that carpet removal can be accomplished without removing thresholds.

3. Carpet surface shall be smooth and level at junction with thresholds.

4. Carpet in passenger area shall be one piece. A single transverse seam is permissible provided seam is not visible and is constructed in accordance with requirements of Section 19, entitled "MATERIALS AND WORKMANSHIP," herein.

5. Carpeting and underlayment pad material shall be as specified in Section 19, entitled "MATERIALS AND WORKMANSHIP," herein.

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B. Interior Liners:

1. Interior liners shall comply with materials and fire-resistance requirements of Section 19, entitled "MATERIALS AND WORKMANSHIP," herein.
2. Interior liners shall be designed to eliminate unnecessary joints and to accommodate dimensional changes due to fluctuations in environmental conditions. Interior liners must be removable from completed car.
3. Attachments to structure shall be made by concealed fasteners in manner that discourages vandalism or tampering, but allows easy removal of linings for maintenance procedures.
4. Installed interior liners shall be designed to withstand the deflections and impact loads specified in HP LaserJet II DHPLAID.PRSIure to which they are attached or with which they come in contact.
6. Finish and surface of liners shall facilitate the removal of graffiti. Appearance of interior liners shall be of uniform quality throughout.
7. Lining materials shall be supported sufficiently to prevent sagging and drumming.
8. Lining contours shall be as shown on Contract Drawings.

C. Interior Fasteners:

1. Interior fasteners shall comply with tamperproof requirements of Section 19, entitled "MATERIALS AND WORKMANSHIP," herein.

D. Door Pockets:

1. Door pockets adjacent to each side door location shall match side lining in appearance.
2. Access doors shall be provided in door pockets and shall have hinges and locking arrangement that operate using standard car key. The number of locks per door shall be kept to a minimum.

E. Windscreens: Windscreens shall be located, as indicated, between side door opening and adjacent seat.

F. Partitions: Partitions between cab areas and passenger seating areas shall have same appearance as wall and ceiling liners and be located as shown on Contract Drawings.

G. Thresholds:

1. Door thresholds shall have anti-slip pattern machined or extruded into surface and incorporate guides for sliding doors where applicable.
2. Threshold plates shall have weathertight connections at floor and door casing and shall drain to outside.

H. Equipment Lockers:

1. Electrical and electronic control equipment shall be located in cab areas, Y-end and X-end walls of cars as shown on Contract Drawings.
2. Control Equipment:
 - a. Control equipment not located in secured cab area shall be located behind panels secured with key locks operable with standard car key.
 - b. Locations of control equipment shall be as shown on Contract Drawings.
3. Equipment lockers shall be provided with air vents as required.
4. Equipment lockers shall provide equipment protection in accordance with NEMA 250 Type 2 enclosure.

I. Deflection and Impact Loads:

1. Interior linings, windscreens, and partitions shall be designed to following deflection and impact load conditions and be integrated with supporting structure such that integrity of supporting structure is retained under these loads when tested in both directions:
 - a. Static Loading: Centrally applied static load of 30 pounds applied on maximum area of four square inches shall not deflect panels more than 1/360 of short span between carbody structural supports.
 - b. Uniform Pressure: Uniform pressure of 15 pounds per square foot shall not deflect panels more than 1/360 of short span between carbody structural supports.
 - c. Impact Loads: Panels shall be designed to resist centrally applied impact load of five foot-pounds applied on maximum contact area of four square inches, incurring deflection no greater than 1/180 of short span between carbody structural supports, without permanent deformation or cracking.

J. Access Doors: Access doors shall be flush-mounted type.

3.13 WINDOWS**A. General:**

1. Safety glass shall be as specified in Section 19, entitled "MATERIALS AND WORKMANSHIP," herein.
2. Windows shall not leak water.
3. Windows shall be single-glazed.
4. Windows shall be installed with tempered side toward inside of car.
5. Window sizes shall be as shown on Contract Drawings.

B. Car Side and Side Door Windows:

1. Windows shall be integral units, fixed type, with elastomeric glazing beads, sizes and shapes as shown on Contract Drawings.

2. Glass shall be Group II.

C. Cab Side Windows:

1. Windows shall have drop sash, which shall be held securely in closed positions by means of latch. Additionally, sash shall be counter balanced with maximum force required to start the cab window moving at any point of fifteen pounds and the maximum force to cause the window to travel through the mid point, up or down, of ten pounds.

2. Window opposite console shall have standard key lock for locking in closed position from inside the cab.

3. Windows shall be weatherstripped and reinforced.

4. Windows shall be fitted with mutes to prevent rattling.

5. Glass shall be set in elastomeric glazing beads.

6. Glass shall be Group II.

7. Window design shall ensure compliance with life test requirements of Section 17, entitled "TESTING", herein.

D. End Door Windows:

1. Each end door shall have window installed as shown on Contract Drawings.

2. Glazing shall be Group III.

E. Cab Door and Partition Windows:

1. Windows in cab door and partition shall be located in upper half of each structure.

2. Glass in cab partition and cab door shall be supported directly in elastomeric glazing strips.

3. Glass shall be Group III.

F. Windshields:

1. Glass shall be set in opening such that it cannot be forced into car.

2. It shall be retained in elastomeric glazing section and be replaceable from outside of car without need for sealing compounds.

3. Glass shall be Group I.

G. Pressure Loading:

1. Windows as installed shall be designed for air pressures acting perpendicularly to window surface in both positive and negative direction as specified in Section 2, entitled "SYSTEM REQUIREMENTS," herein with minimum safety factor of 2.5 against failure.

2. Deflections shall be limited to length/180 of short span.

3.14 SEATS**A. General:**

1. Seating arrangement and configuration shall be as shown on Contract Drawings.

2. Seats shall comply with applicable requirements of Article 3.04, entitled "INTERFACE REQUIREMENTS," herein.

3. Materials shall comply with requirements of Section 19, entitled "MATERIALS AND WORKMANSHIP," herein.

4. Seat design shall ensure compliance with life test requirements of Section 17, entitled "TESTING," herein.

B. Passenger Seats:

1. Structure: Attachment of seats shall be to side wall and shall not create dirt-holding pockets and supporting structure shall not be visible.

2. Grab Handle and Crash Pad:

a. Grab handle and crash pad shall be energy absorbing.

b. Crash pads shall be provided for upper rear side of seat back.

c. Crash pad shall be designed for Head Injury Criteria number expressed in FMVSS 222 less than 1,000 at impact velocity of 22 feet per second.

d. Crash pad material shall comply with requirements of Section 19, entitled "MATERIALS AND WORKMANSHIP," herein.

3. Cushions:

a. General:

1) Foam padding and cover material of seat bottom and back cushions shall comply with requirements of Section 19, entitled "MATERIALS AND WORKMANSHIP," herein.

2) Corresponding cushions shall be completely interchangeable, and as shown on Contract Drawings.

3) Seat and back cushions shall consist of padding material and removable covers.

4) Seat cushions shall be supported by serpentine springs.

5) Back cushions shall be supported by rigid inner panels.

4. Longitudinal seats do not require grab handle.

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5. Loads:

a. Passenger seat structure, including car body support structure and attachments to vehicle structure, shall be designed to resist loads listed in following Sub-Article without permanent deformation.

b. Seats or seat components shall not separate from car wall section at any attachment point with following individual loads applied:

1) Distributed load of 495 pounds per passenger applied horizontally along and normal to upper edge of seat back in either direction.

2) Vertical load of 250 pounds applied downward on top edge of seat back at mid-span of dual seat.

3) Vertical load of 500 pounds per passenger applied in center of each seat bottom.

4) Vertical load of 500 pounds per passenger applied at center of front edge of each seat.

5) Handhold load of 330 pounds applied in any direction.

c. Two padded armrests shall be provided for each combination seat assembly.

C. Train Operator's Seat: Seat shall:

1. Be located directly behind console.

2. Be capable of 4.5 inches longitudinal and 8.5 inches of traverse travel with positive position stops.

3. Be capable of vertical adjustment of between 18.5 and 23.7 inches above top of floor with positive position stops. Additionally, assembly shall contain spring-loaded mechanism to assist seat height adjustment.

4. Be capable of swiveling at least 90 degrees from forward to either side. The back of the seat shall have the corners rounded and/or tapered to allow the seat to swivel in the fully rearward position without hitting the head end relay panel doors. There must be positive stops to prevent the seat from hitting the console when it swivels.

5. Have structure, support, attachments, and adjustment locking mechanisms capable of withstanding, without permanent deformation or disengagement, in all positions, vertical uniformly distributed load of 330 pounds applied at forward edge of seat and horizontal uniformly distributed load of 500 pounds applied normal to upper edge of seat back.

6. Be constructed of seat materials complying with same fire-resistive requirements as passenger seats.

7. Shall be completely interchangeable with Alstom P/N 0346931000 Train Operators seat used on District C-cars purchased under contract 42AA-110.

D. Retractable Folding Seat:

1. Folding seat shall be as shown on Contract Drawings.

2. Seat dimensions shall be as follows:

a. Folded 8.75" from wall maximum

b. Open 44" wide x 18.5" deep

3. Design and color shall be similar to other seats.

4. Seat shall return to folded position when not in use.

5. Height of seat shall be 18" above top of floor.

6. Vertical load requirement shall be as specified in Article 3.14B.5 as applicable.

3.15 HANDRAILS, GRAB HANDLES, AND CREW STEPS**A. Handrails:**

1. Handrails shall be as indicated and allow overhead clearance of 76 inches minimum.

2. Handrail fittings shall be aluminum, of similar construction, shall provide tight and rattleproof fastening, and shall be free of burrs and sharp edges.

3. Each handrail shall be stainless steel tubing and shall withstand, without permanent deformation, distributed load of 10 pounds per inch applied at any angle within 45 degrees from vertical downward.

4. Handrails through doorway area must be padded with a material similar to the texture and cushion of the grab handle. This padding will be orange in color.

5. Padding material shall with requirements of Section 19, entitled "MATERIAL AND WORKMANSHIP", herein.

6. Shall be completely interchangeable with Alstom P/N 0339646000 Handrails used on District C-cars purchased under contract 42AA-110.

B. Crew Grab Handles and Steps

1. Crew grab handles and steps shall be provided at side of each car, as shown on Contract Drawings.

2. Each grab handle shall be stainless steel and shall withstand, without permanent deformation, concentrated load of 330 pounds applied at its midpoint acting in any direction.

a. Grab handle shall be completely interchangeable with Alstom Part #TRR340654, Grab handle used on District C-car purchased under contract 42AA-110.

3. Steps shall be designed with safety factor of 1.5 against yield, to withstand loads imposed by 300-pound person and shall be as shown on Contract Drawings.

3.16 DOORS

A. General: Cars shall have four types of doors: side doors, end doors, cab doors, and flipper doors, which shall be as shown on Contract Drawings.

B. Side Doors:**1. General:**

a. Each side doorway shall contain sliding doors of the bi-parting type, opening from center, and retracting into pockets in car side wall.

b. Doors shall be as shown on Contract Drawings.

c. There shall be window in top half of each door leaf as shown on Contract Drawings.

2. Construction:

a. Doors shall be adequately reinforced internally to provide strength and rigidity. Additionally, appropriate drain holes shall be provided at bottom to prevent entrapment and allow drainage of moisture.

b. Joints and Edges:

1) Joints and edges shall be sealed.

2) Door edge shall be tongue-and-grooved as indicated and be black resilient material conforming to material and performance requirements of Sections 19, entitled "MATERIALS AND WORKMANSHIP," and 6, "DOOR OPERATION AND CONTROL," herein.

c. Door panels shall be aluminum with interior and exterior finish same as used on transit vehicle exterior.

d. Side doors and mounting hardware shall be constructed to provide proper strength and rigidity to sustain, with maximum deflection of 0.5 inch, force of 200 pounds applied from inside on an area of 24 inches by 12 inches, with long axis parallel to that of door two inches from door edge and centered within height of door.

e. Doors shall be weatherstripped for sealing as required to comply with climatic and noise environments as specified in Section 2, entitled "SYSTEM REQUIREMENTS," herein. Additionally, drain pan shall be installed in door pocket areas to drain water clear of underfloor apparatus.

f. Doors and mounting hardware shall:

1) Withstand external air loads and negative air pressure as specified in Section 2, entitled "SYSTEM REQUIREMENTS," herein.

2) Operate and withstand temperature differential across doors for winter and summer conditions as specified in Section 2, entitled "SYSTEM REQUIREMENTS," and air environments as specified in Section 7, entitled "HEATING, VENTILATING, AND AIR CONDITIONING," herein.

3. Installation and Operation:

a. Each door leaf shall be hung at top from low-friction track and ball arrangement, with guide at bottom to restrict lateral movement.

b. Convenient access to door adjustments shall be provided.

c. It shall be possible to remove and replace door leaf without removing windscreens.

d. Doors shall not rattle or vibrate in closed position.

C. End Doors:**1. General:**

a. Doors shall be designed to be manually opened but shall have mechanism that shall cause doors to close when released. Additionally, mechanism shall include adjustable decelerating device to ensure safe closing operation.

b. Each end door shall have window in top half as shown on Contract Drawings.

2. C-car Y-end doors shall:

a. Be single-leaf type, retracting fully into pocket in end wall, as shown on Contract Drawings.

b. Be hung at top from low-friction track and ball arrangement with appropriate guides at bottom to restrict fore and aft movement.

c. Be designed to exclude weather elements experienced during layup with flipper doors open.

d. Have construction same as side doors.

e. Be designed for air loads as specified in Section 2, entitled "SYSTEM REQUIREMENTS," with flipper doors open on door surface area, including window, with minimum safety factor of 2.0 against yield.

3. B-car Y-end and X-end doors and C-car X-end doors shall:

a. Be bi-parting leaf type, opening from center and retracting into pockets in car end walls as shown on Contract Drawings.

b. Have support and construction details same as those for side doors.

c. Be designed to withstand air loads on door surface area including window with minimum safety factor of 2.0 against yield.

d. Be defined to exclude weather conditions as specified in Section 2, entitled "SYSTEM REQUIREMENTS," herein.

D. C-car Cab doors shall:

1. Be swinging door that shall close off whole cab end to passengers or train operator's console location only.

2. Have window in top half.

3. Latch and lock in closed positions.

4. Utilize standard car key for access from outside cab.

5. Provide cab curtain latches as shown on Contract Drawings. Latch style shall be Carr Fastener Company, Part No. 78322, or equal.

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E. C-car Flipper Doors:

1. Flipper doors shall be provided as shown on Contract Drawings.
2. Opening and closing of doors shall be manual and be positively retained in both open and closed positions. Manual operation of door shall be accomplished using one hand.
3. Doors shall be:
 - a. Designed to withstand wind loads and pressure differential specified in Section 2, entitled "SYSTEM REQUIREMENTS," herein for both open and closed positions.
 - b. Operable from both outside and inside car using standard car key.
 - c. Able to withstand loads caused by interfacing with existing car and C-car closures.

F. Door Attachment and Restraining Hardware:

1. Side Doors and End Doors:
 - a. Door Hangers: Sliding door panels shall be supported by at least two hangers at top of door. Continuous hanger is considered to meet this requirement.
2. Cab Doors:
 - a. Cab doors shall be hinged and provided with latch on door to secure door into the two closed positions as shown on Contract Drawings.
 - b. Doors shall be set to swing through 180 degrees from train operator's area side wall into passenger area.
 - c. Stops shall be provided to prevent damage to door or other structure.
 - d. Door latch shall positively stop door at 90 degree position when being operated in either direction.
3. Access:
 - a. Easy access shall be provided to door hardware for removal, installation, repairs, and maintenance.

3.17 INTERCAR CLOSURE**A. General:**

1. Both ends of each car shall have intercar closures to provide safe passage between cars as shown on Contract Drawings.
2. Closure assembly shall be designed to operate safely under environmental conditions as specified in Section 2, entitled "SYSTEM REQUIREMENTS," herein.
3. Closure shall comply with requirements of Article 3.04, entitled "INTERFACE REQUIREMENTS," herein.

B. Description: Design shall:

1. Be as indicated and include buffer faceplate suspension seal.
2. Eliminate metallic contact at interface between cars and metallic connection between this interface and car bodies. Sliding contact shall be prevented except at surface of closures.

C. Construction Details:

1. Each car end closure section shall consist of buffer faceplates extended from car end sill by elastomeric shear springs capable of angular and longitudinal motion.
2. Footplate hinged from end sill shall bridge gap to buffer faceplate top flange.
3. In uncoupled position, end-closure assembly shall support live load of 300 pounds with out excessive deflection.
4. Above buffer faceplate and seal, diaphragm of resilient or extruded elastomeric tubes, having sufficient elasticity and capable of providing enclosure between cars in conditions resulting from coupled mainline service on the District's property shall be provided. Additionally, diaphragm on one car shall directly contact that on adjacent car without use of diaphragm faceplates.

D. Faceplate Springs: Buffer faceplate springs shall provide minimum 700 pounds of pressure in coupled position, which shall be deflected one inch from free position.

E. Loads: Intercar closure shall be designed to withstand wind loads as specified in Section 2, entitled "SYSTEM REQUIREMENTS," herein.

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SECTION 3

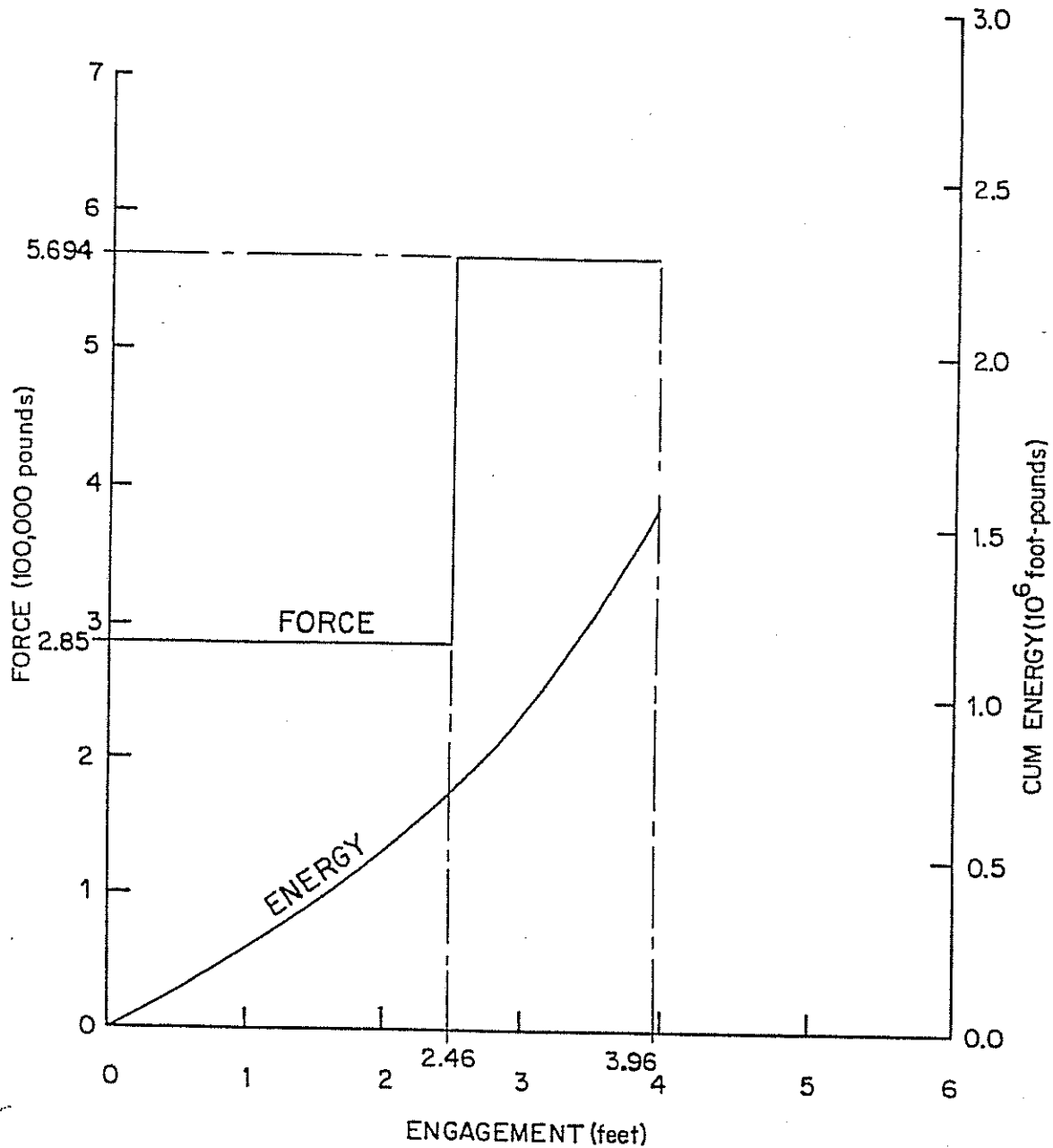


FIGURE 3-1 - CRUSHING FORCES & ENERGY
2-CAR TRAIN COLLIDING WITH IDENTICAL TRAIN AT AWO

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Car Body

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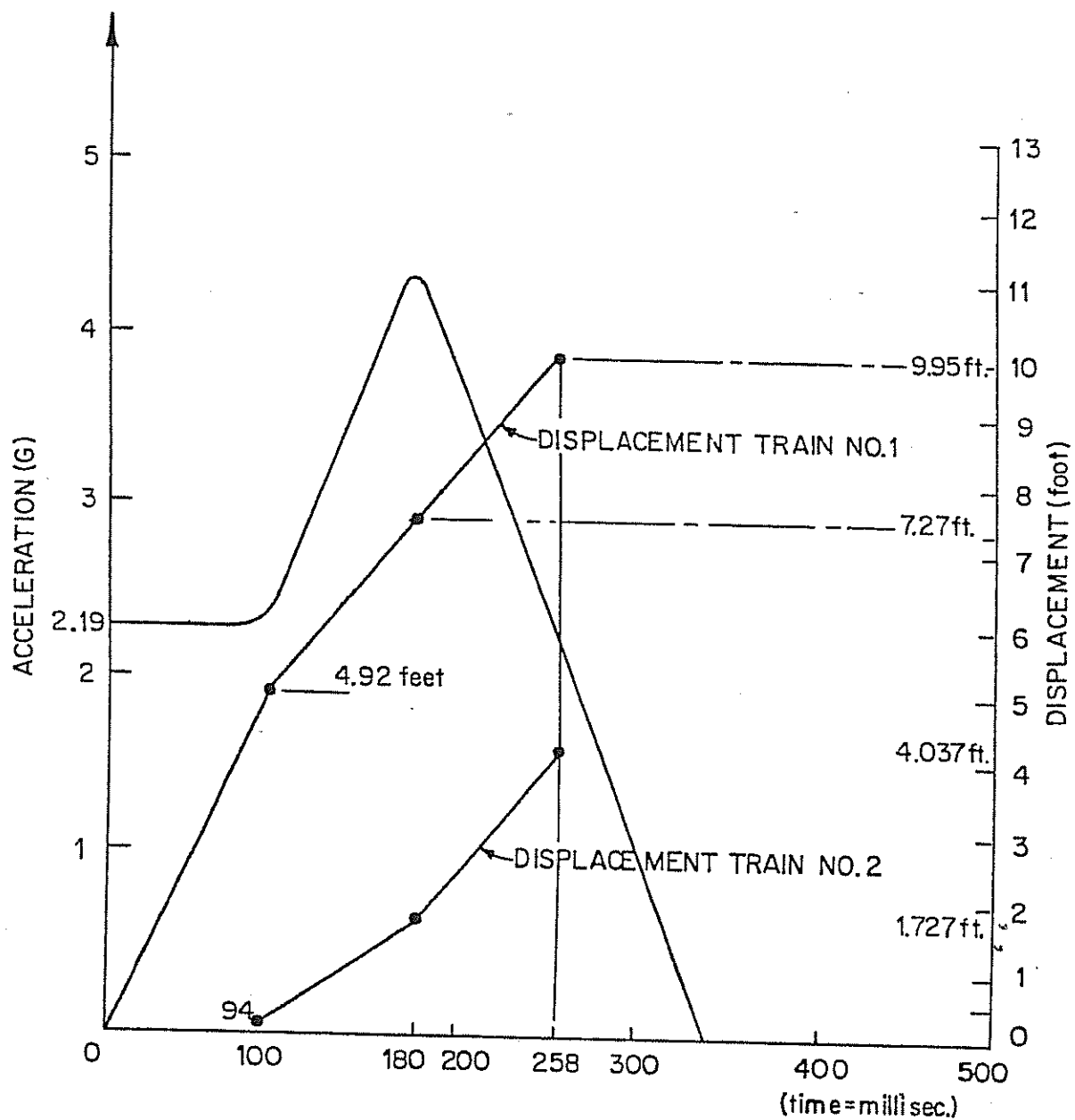


FIGURE 3-2 - ACCELERATION & DISPLACEMENT FOR EACH 2-CAR TRAIN COLLIDING WITH IDENTICAL TRAIN AT AWO

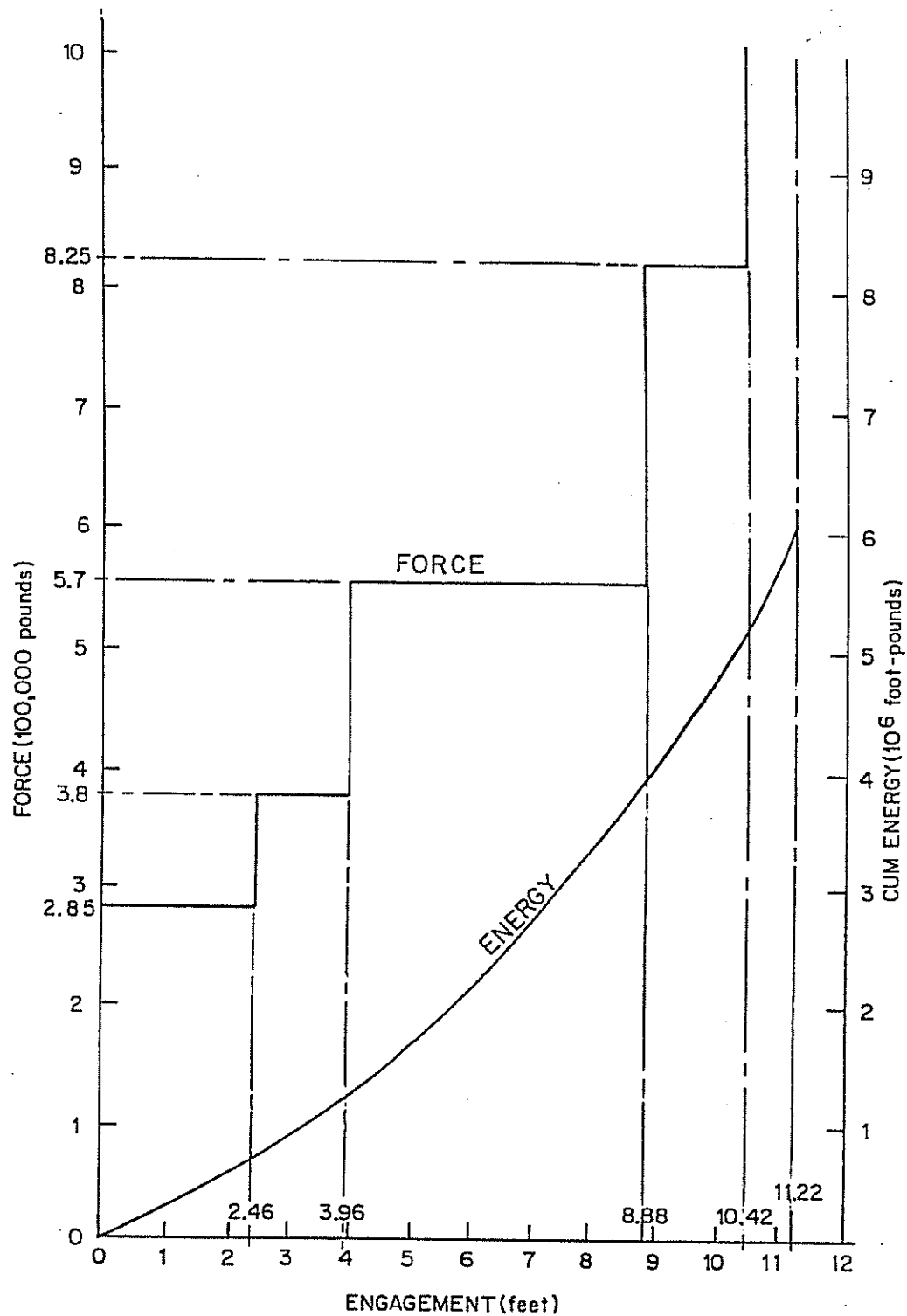


FIGURE 3-3 - CRUSHING FORCES & ENERGY
4-CAR TRAIN COLLIDING WITH IDENTICAL TRAIN AT AW1

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Car Body

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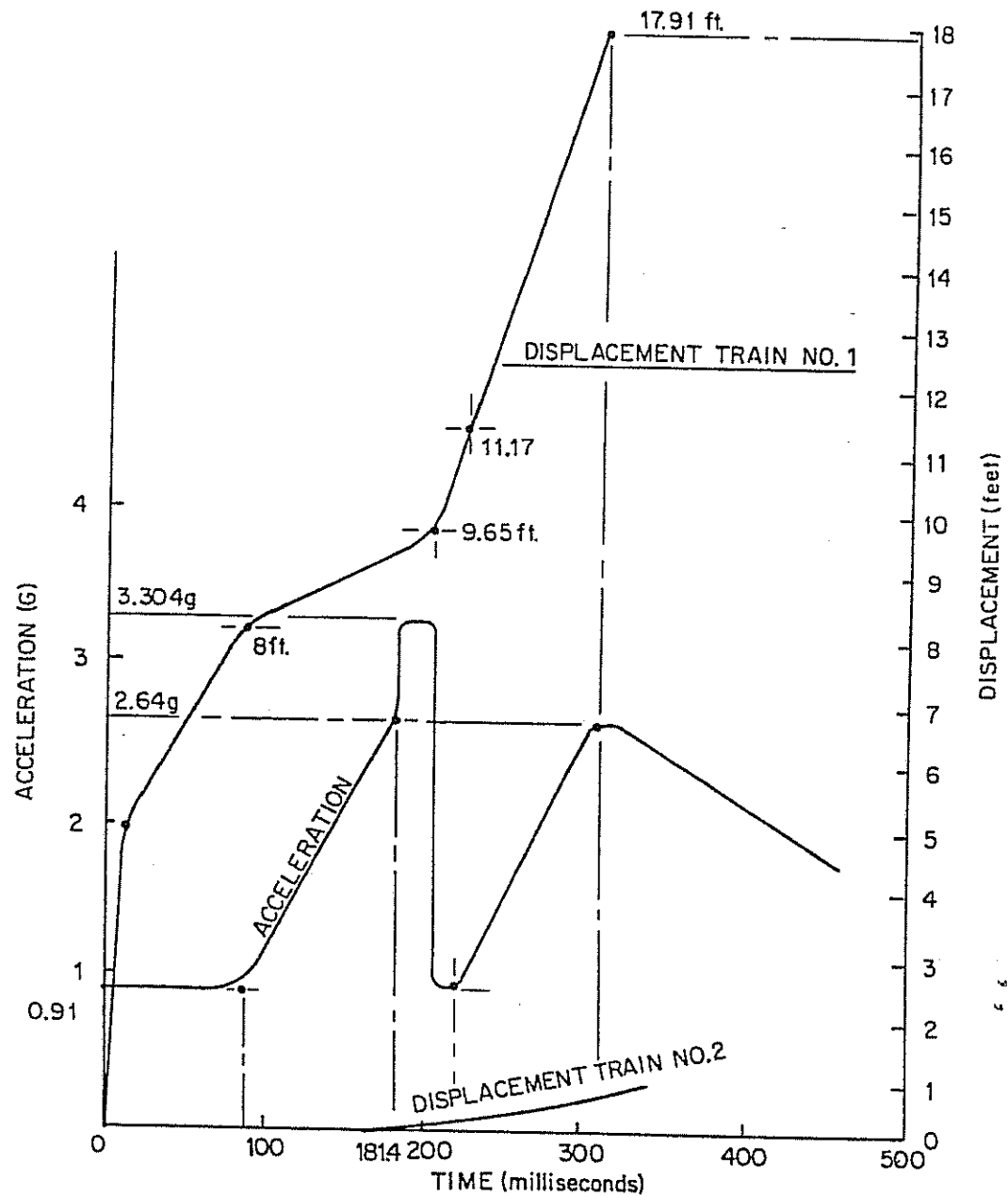


FIGURE 3-4 - ACCELERATION & DISPLACEMENT FOR EACH
4-CAR TRAIN COLLIDING WITH IDENTICAL TRAIN AT AW1

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SECTION 3

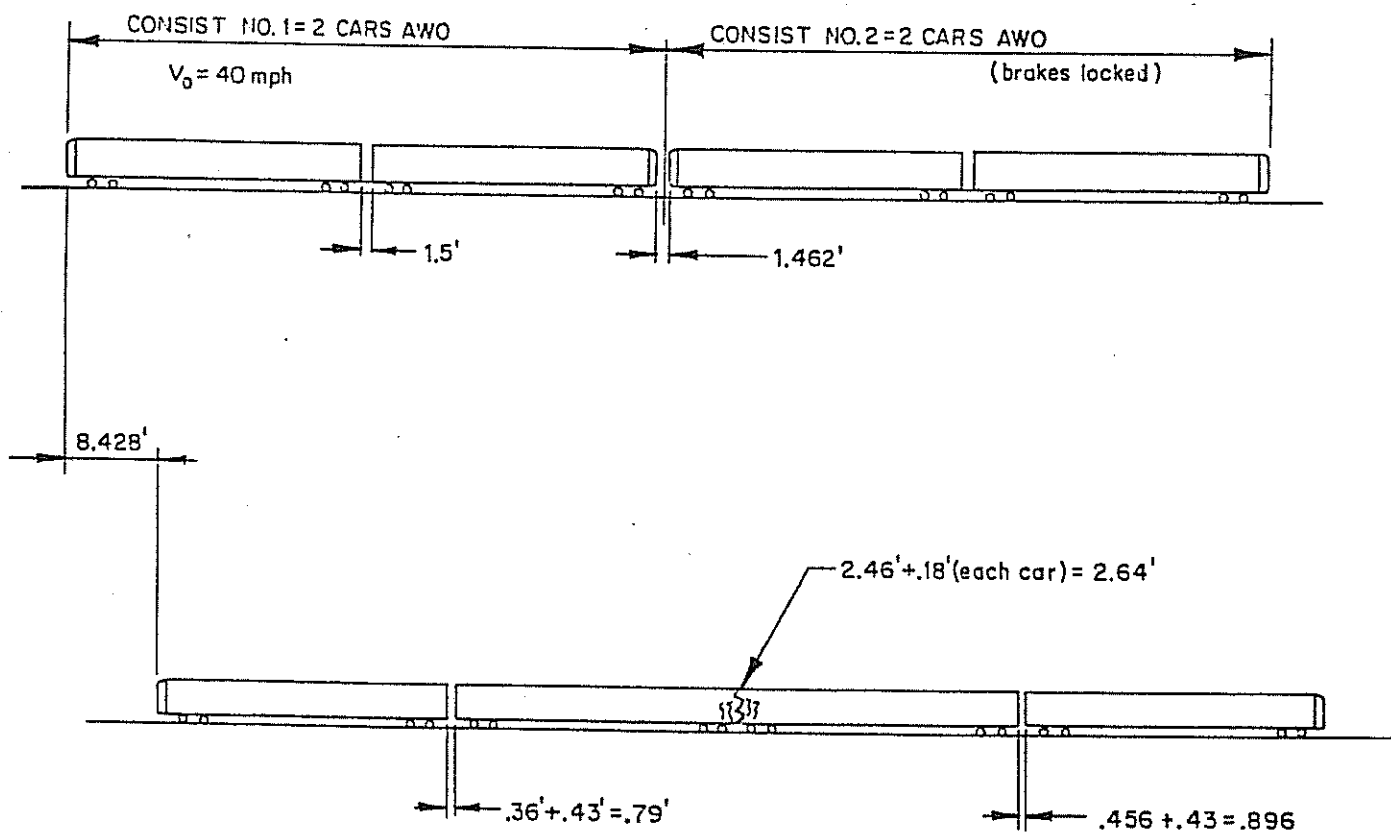


FIGURE 3-5 - PRE & POST IMPACT TRAIN DISPLACEMENTS

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Car Body

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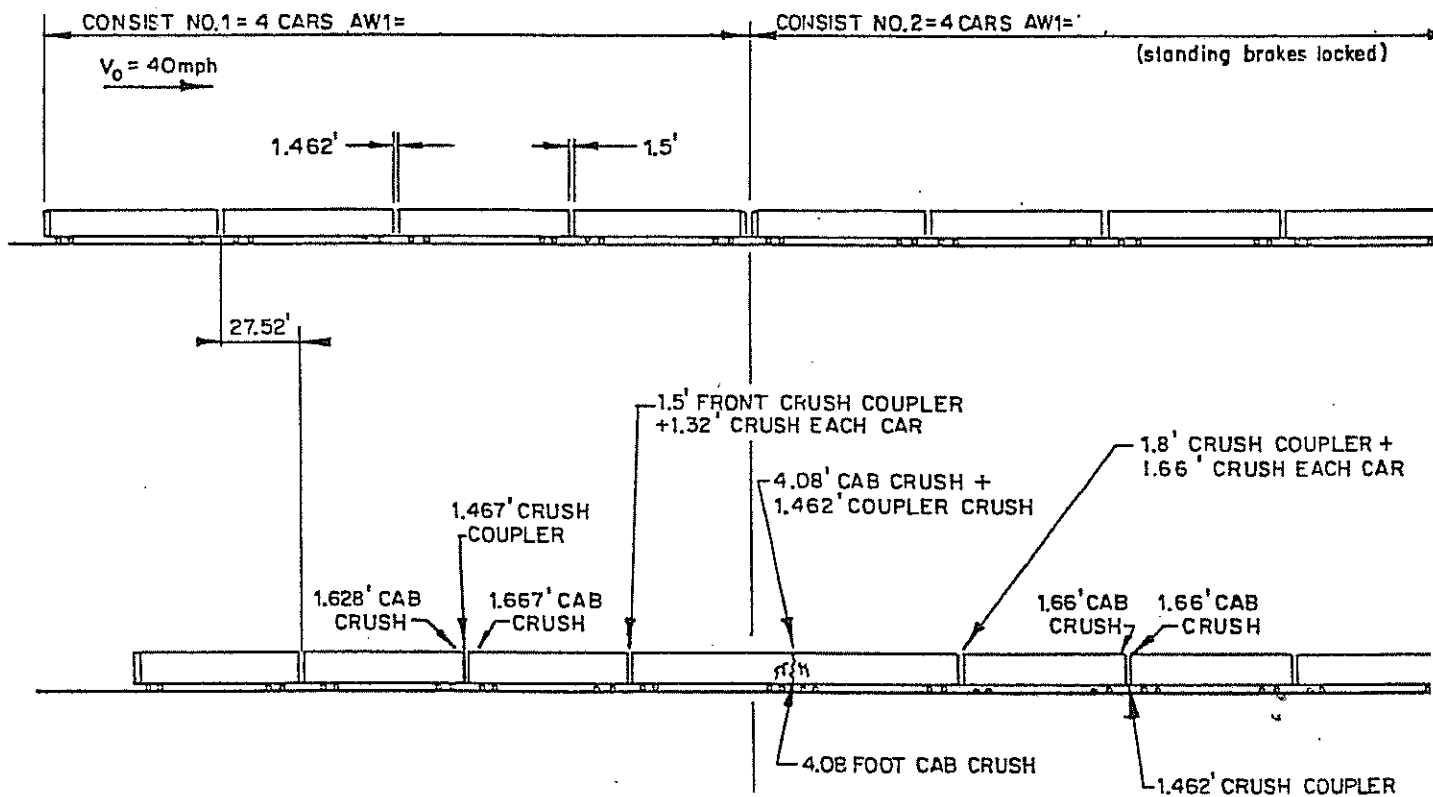


FIGURE 3-6 - PRE & POST IMPACT TRAIN DISPLACEMENT 4-CAR TRAIN

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SECTION 3

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SECTION 6

DOOR OPERATION AND CONTROL

6.01 DESCRIPTION

A. This section specifies the requirements for side-door, end-door, and cab-door mechanisms, controls, devices, and associated safety and annunciation items for each car.

B. Door Construction and Hardware: See Section 3, entitled "CAR BODY," herein.

6.02 CITED REFERENCES

A. AWS - American Welding Society

1. D1.1-88 Structural Welding Code - Steel
2. D1.2-83 Structural Welding Code - Aluminum
3. D1.3-89 Structural Welding Code - Sheet Steel
4. QC1-88 Qualification and Certification of Welding Inspectors

B. Code of Federal Regulations (CFR)

1. 49-CFR-609 Transportation for Elderly and Handicapped Persons

6.03 SUBMITTALS

A. ~~Layout Drawings:~~ Provide system and subsystem schematic and layout drawings of electrical and mechanical systems.

6.04 INTERFACE REQUIREMENTS

A. Side door leaf assemblies shall be completely interchangeable with and equal to GEC-Alstom door leaf assemblies P/N 0339052101 (LH) and P/N 0339052100 (RH) used on District C-cars.

B. Door operating mechanisms including Connections to Doors, Door Panels and Door Hangers shall be completely interchangeable with the following components used on the District's existing C-cars supplied under Contract 42AA-110 .

1. Deleted
2. Deleted
3. Deleted
4. Deleted
5. Deleted
6. Extension Arm LH - Vapor P/N 56930310-01
7. Extension Arm RH - Vapor P/N 56930309-01
8. Hanger, Side Door - Faveley P/N V128017-102

9. Cutout and Panel Sensing Assembly - Vapor P/N 58640193

10. Cutout and Panel Sensing Assembly - Vapor P/N 58640192

11. Door Check Assembly - Vapor P/N 57040051-01

6.05 SIDE DOORS

A. **General:**

1. Doors:

a. Provide doors for passenger entrance and exit movement between platform and car. Each doorway shall contain sliding doors of bi-parting leaf type with two leaves per door, opening from center, and retracting completely into pockets in car side wall. A clear door opening of 53.5 inches minimum shall be provided.

b. Door control signals shall be trainlined so that all doors on each side of train may be operated automatically by automatic train control system or manually by train operator at activated console, as specified in Section 2, entitled "SYSTEM REQUIREMENTS," herein.

2. Power: Each side door leaf shall be powered by electro mechanical operator.

3. Operating Time:

a. Each door leaf shall:

1) Take maximum of one and one-half seconds to move from closed position to within three inches of fully open position.

2) Take not less than two seconds nor more than two and one-half seconds to move from fully open position to fully closed and locked position.

b. Operating speeds shall be adjustable for door synchronization.

c. Door leaves shall decelerate at each extremity, to preclude slamming or rebound, and be brought to rest gently at extremity of door travel.

4. Closing Force: Each door leaf shall:

a. Exert closing force of not less than 15 pounds and not more than 30 pounds, as measured at midstroke.

b. Open or close with 60-pound total force applied perpendicularly to center line of interior door surface.

B. **Door Operating Mechanism:**

1. Door Operators:

a. Operators and associated hardware shall be located between inner and outer wall surfaces of transit vehicle.

b. Easy access to entire door operator mechanism shall be provided for removal, installation, repairs, and maintenance. Access to door operator mechanism shall be by standard car key only. Access panel shall remain attached to car interior when open.

c. Adjustments shall be readily available from exposed side of door operator.

d. Pivot points and bearings of multiplying lever(s) shall be integral parts of operator package.

e. Connection to doors shall:

1) Be by means of self-aligning arms.

f. Operators and operating linkages shall provide sufficient damping to keep doors from bouncing off their stops at end of either opening or closing cycles.

g. Operators shall hold doors in open position without recycling while cars are standing on grades up to and including, one and one-half percent.

h. All fasteners between door leaves and over-centering limit switches shall be lockwired complying with requirements of Section 19, entitled "MATERIALS AND WORKMANSHIP," herein.

i. All welds shall be in accordance with AWS specifications D1.1-88, D1.2-83, D1.3-89 as applicable. Welding shall be inspected and approved by a inspector certified under AWS specification QC1-88.

j. General: Door Operating Mechanisms shall:

1) Be as specified in Section 2, entitled "SYSTEM REQUIREMENTS," herein.

2) Be designed to preclude unintentional signals from operating doors.

2. Power: Doors shall operate from low-voltage circuit with voltage characteristics as specified in Section 9, entitled "AUXILIARY ELECTRICAL EQUIPMENT," herein.

a. When car is in layup status, door system shall draw no power when doors are either closed or open.

3. Operator motors shall:

a. Be protected against thermal overload by cutout switch or device which shall automatically reset when cooled.

b. Not be subject to damage by attempts to move doors in stalled condition or with intermittent operation of thermal overload cutout switch or device.

4. Release Switches and Locks:

a. Door linkage between door operator motor and its door leaf shall contain an over-center linkage geometry or equivalent mechanism that shall prevent manual opening of closed door leaf under normal conditions.

b. Integral emergency operation shall be capable of providing, without use of any key or electrical power, emergency release from:

1) Inside cars on four door leaves near car centers (Numbers 3, 4, 5, and 6).

2) Outside cars for door leaves numbered four and five with accessibility in car crew step. Protection shall be provided for the release handle as shown on Contract Drawings.

c. Emergency release mechanism upon actuation shall interrupt door indication trainline and not allow doors to open until zero-speed indication is received.

d. Emergency release access doors shall be provided with spring-loaded covers.

e. Key-controlled cutout switch shall be located at each side door operator, readily accessible for crew use and capable of complying with following requirements:

1) In event of single operator failure:

a) It shall be possible to make such operator "electrically inoperative" and "electrically inoperative with door leaf mechanically locked in closed position". Additionally, such locking procedure shall activate cutout switch signal circuit.

b) Other door leaf in opening affected shall continue to operate.

c) When in the "electrical inoperative" only position the Door Cutout Switch Panel access door will be prevented from being closed and locked.

d) Access to the cutout switch shall not expose the door operator mechanism.

5. Operator limit switches shall:

a. Be replaceable-unit type complying with requirements of Section 19, entitled "MATERIALS AND WORKMANSHIP," herein.

b. Be designed and installed such that if they are replaced, no adjustments shall be necessary to obtain proper functioning.

c. Have "door closed" indication which shall be given only after leaves are positively closed and locked. Additionally, this indication shall be activated by door leaves.

C. Door Control Systems:

1. General: Control systems shall:

a. Be as specified in Section 2, entitled "SYSTEM REQUIREMENTS," herein.

b. Be designed to preclude unintentional signals from operating doors.

2. Trainlined Door Operation:

Door Operation and Control

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a. Operate from trainlined control to provide separate control components for opening and closing doors on both sides of cars, complying with following and as indicated:

1) Doors of train shall unlock, open, and remain open on continuous, trainlined, low-voltage signal unfiltered and unregulated. Additionally, removal of signal shall automatically close doors.

3. Local Operation:

a. Door panels numbered two and four and five and seven as indicated shall be designed to open or close electrically from outside by using standard car key.

b. All door sets shall be designed to open or close electrically, from controls inside car, by using standard car key.

c. Local door controls:

1) Positive action shall be required to open and close doors from either actuating location. Additionally, it shall be possible to remove key following any actuation to facilitate routine entry and exit by maintenance personnel.

2) Doors opened by local control shall close after doors are opened and then closed by trainline control.

3) Crew Switches:

a) Interior: Provide switches placed in readily accessible location adjacent to doors.

b) Exterior: Provide switches located as shown on Contract Drawings.

4. Door Closing Warning:

a. Tone Initiation, reference Section 14, entitled "TRAIN CONTROL", herein.

b. Visual warning signals shall be provided to alert passengers of closing doors in compliance with 49-CFR-609, Transportation for Elderly and Handicapped Persons.

5. Obstruction Detection: Door edge shall:

a. Be tongue-and-grooved as indicated and constructed of resilient material complying with requirements of Section 19, entitled "MATERIALS AND WORKMANSHIP," herein.

b. Have sufficient stiffness to prevent side doors from locking when solid test specimens two inches wide by three-eighths inch thick, or three-quarters inch diameter bar are individually inserted between leaves.

6. Door Pulsations: Door circuit system shall include timing circuit, which in event door panel or panels are obstructed during closing cycle, shall automatically interrupt motor circuit three seconds after start of closing operation and then attempt to close panels in six-second intervals until panels are completely closed and locked.

D. Interlocking: Interlock and detection circuits are safety critical circuits. Provide following control interlocking when operating as lead car of train:

1. Door Controls:

a. Shall be so interlocked that doors cannot be opened until train berthing signals and train zero speed signal are generated by automatic train operation as specified in Section 2, entitled "SYSTEM REQUIREMENTS," herein.

b. Shall have automatic bypass of berthing signals in "Yard Manual" mode.

2. Traction Control: Input signals to traction system shall be so interlocked with door control system that no train can be moved in any mode of operation except Yard Manual until all doors are closed and locked on each car. Additionally, if any door is opened while train is in motion, an irretrievable open-loop brake application shall be initiated.

a. Provide door interlock by-pass switch and circuit as indicated to enable emergency train movement.

E. Door Signals:

1. Door control system sensors with normally open contacts shall provide necessary logic to annunciator system, as specified in Section 9, entitled "AUXILIARY ELECTRICAL EQUIPMENT," herein, to indicate the following:

a. C-car:

1) Side Doors not fully closed and locked.

2) Flipper Doors not fully closed and locked or fully open and locked.

b. B-car:

1) Side Doors not fully closed and locked.

2. Local Status Annunciator:

a. Provide annunciator at each door leaf to indicate leaf status. Annunciator to be energized to indicate door is not closed and locked and has not been cut out.

F. Door Diagnostics:

1. Provide diagnostic system that shall continuously monitor operation of side doors and side door controls, and record and save any operational faults in a non-volatile memory with a minimum eight Kbytes capacity. Fault memory shall be resettable at the primary maintenance level. Additionally, a data logger shall be provided and shall reside in non-volatile memory. This information shall be examined or retrieved by using a terminal as specified in Section, 15 entitled "SYSTEM SUPPORT," herein. All fault data shall be preserved in Battery Backed RAM.

2. Each fault shall be time dated and recorded in Pacific Standard Time (PST).

3. Fault data examined or retrieved shall be displayed in English, display shall indicate fault type without the use of cross references.

4. In addition to operational faults the diagnostic system shall record the following:

a. Door leaf(s) opened in yard manual mode of operation.

6.06 END DOORS

A. General: Doors shall not require opening force in excess of:

1. C-car X-end, and B-car X-end and Y-end - 20 pounds
2. C-car Y-end - 15 pounds

B. C-car Y-End Door: Door shall:

1. Be operated manually and close automatically when released.
2. Open by pushing door to left (from inside car) into door pocket in end wall. Additionally, provide recess in door casing to prevent injury to personnel.

C. C-car X-end and B-car X-end and Y-end doors: Doors shall:

1. Be operated manually, be double sliding into door pockets, and be automatically returned to normal closed position when released.

6.07 C-CAR FLIPPER DOORS

A. Doors shall be:

1. Positively latched in both open and closed positions.
2. Locked when in closed position and require use of standard car key to unlock.
3. Provided with signals which shall, when doors are closed and latched allow control logic to determine that car is in end-of-train position: when open and latched, allow operation as mid-train car including hostling function; and, when not latched, prevent operation from adjacent cab in any mode. Additionally, provide bypass circuit for both modes.

6.08 SPECIAL TEST EQUIPMENT

A. Provide test equipment as specified in Section 15, entitled "SYSTEM SUPPORT," herein.

EXHIBIT “F”

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

NOTICE TO SUPPLIERS REQUESTING PROPOSALS

NOTICE IS HEREBY GIVEN that sealed Proposals will be received until the hour of 2:00 p.m., October 1, 1991 at the District's Offices, Reception Room, Fifth Floor, 800 Madison Street, P. O. Box 12688, Oakland, California, 94604-2688, for the Procurement of Transit Vehicles, Contract No. 42DA-110. Proposals will thereafter be rejected by the District.

The time for receipt of Proposals may be extended by the General Manager of the District, or authorized representatives, for a period not to exceed 30 days. Notice of such extension will be published at least once in a newspaper of general circulation in the District, which publication will be at least 10 days before Proposals are formally received.

The Work in general consists of providing fully operational transit vehicles, ready for revenue service as an integral part of the Bay Area Rapid Transit District system. The Work shall include all engineering, materials, tools, equipment, mock-ups, manufacturing, installation of District-furnished equipment and materials, testing, delivery, publications, warranty, preventive maintenance, training, and acceptance testing of finished vehicles on the BART system, all as indicated.

The Supplier under the Contract may use certain C-Car Technology on the terms and conditions set forth in Attachment A "C-Car Technology License Agreement" and in a Sublicense Agreement to be executed and delivered by GEC Alsthom, S.A., the District and the Supplier in the form of Schedule 1.4 to the C-Car Technology License Agreement. Prospective Suppliers who so desire may have access to such C-Car Technology in preparing Proposals on the terms and conditions set forth in Section 2.3(c) of the C-Car Technology License Agreement. Prospective Suppliers who desire such access must submit a completed Prospective Supplier Agreement in the form of Schedule 1.8 to the C-Car Technology License Agreement when obtaining Proposal Documents. Each Prospective Supplier will receive assistance from GEC Alsthom, S.A. pursuant to Section 2.3(b) of the C-Car Technology License Agreement.

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Notice to Suppliers

A pre-proposal meeting will be held on August 28, 1991 to explain the procurement and answer questions of parties interested in contracting for the work. The pre-proposal meeting will convene at 8:30 a.m. at the District's Offices, in the Board Room, First Floor, 800 Madison Street, Oakland, California. At the pre-proposal meeting the District's Disadvantaged Business Enterprise (DBE) participation policy will be explained and DBE opportunities discussed. Prospective proposers are requested to make every effort to attend the pre-proposal meeting as it is the only one scheduled. A tour of the location for the temporary facility for performance of Warranty and maintenance work will be conducted at 2:00 p.m. following the pre-proposal meeting at 951 Whipple Avenue, Union City, California. Interested prospective proposers are requested to confirm their intention to attend by notifying the District's Materials Management and Procurement Office, telephone (415) 464-6540, prior to the day of the scheduled pre-proposal meeting.

A competitive negotiated procurement format as described in Section P2 will be used. Proposal shall be submitted in accordance with, and subject to, the conditions contained in Section P2. The award will not necessarily be made to the proposer with the lowest price. Each Proposal must be enclosed in a sealed envelope addressed to the District Secretary of the San Francisco Bay Area Rapid Transit District and endorsed: **PROPOSAL FOR SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT, PROCUREMENT OF TRANSIT VEHICLES, CONTRACT NO. 42DA-110.**

Proposal Documents may be obtained from the District Secretary, San Francisco Bay Area Rapid Transit District, 800 Madison Street, P. O. Box 12688, Oakland, California 94604-2688, at the following prices, which include any applicable sales tax and are not refundable:

Contract Books, including General Provisions, Technical Provisions, Proposal Form and other documents, and reduced Contract and Reference Drawing Book	\$100.00
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Proposers are informed that all of these documents will be required in the preparation of Proposals. Each Proposal must be on prescribed Proposal Forms and must be for the entire Contract.

The District may reject any and all proposals.

All work performed in California shall be performed in accordance with the Laws of the State of California. Special attention is directed to Division 2, Part 7, Chapter 1, Article 2 of the State Labor Code.

This Contract may be subject to a financial assistance contract between the District and the United States Department of Transportation. Attention is directed to the Proposal

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Notice to Suppliers

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Form where all proposers will be required to certify that they are not on the U. S. Comptroller General's list of ineligible contractors. Supplier will be required to comply with all applicable Equal Employment Opportunity Laws and Regulations.

The District hereby notifies all bidders that it will affirmatively ensure that in regard to any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full opportunity to submit proposals in response to this invitation and will not be discriminated against on the basis of race, color, sex or national origin in consideration for an award.

Proposer's attention is directed to Article P10.06 which sets forth UMTA's Disadvantaged Business Enterprise participation policy for this Contract.

Proposer's attention is directed to Article P2.14 entitled "SOUTH AFRICA POLICY," outlining the District's policy on the "Comprehensive Anti-Apartheid Act of 1986".

Each proposal shall be accompanied by a proposer's security equal to at least 10 percent of the Total Proposal Price. The proposer to whom the Contract is awarded shall furnish a Performance Bond in an amount not less than 100 percent of the Contract Price. Bonds shall be on forms provided by the District and shall be executed as surety by a corporation or corporations authorized to issue surety bonds in the State of California, and acceptable to the District.

Dated at Oakland, California, this 1ST day of August, 1991.

/s/ Phillip O. Ormsbee
Phillip O. Ormsbee, Secretary
San Francisco Bay Area
Rapid Transit District

4 of 4

Notice to Suppliers

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EXHIBIT “G”



BAY AREA RAPID TRANSIT DISTRICT
800 Madison Street - Lake Merritt Station
P.O. Box 12688
Oakland, CA 94604-2688
Telephone (415) 464-6000

October 8, 1991

ERLENE DeMARCUS
PRESIDENT

MICHAEL BERNICK
VICE-PRESIDENT

FRANK J. WILSON
GENERAL MANAGER

Subject : Contract Number 42DA-110
Procurement of Transit Vehicles
Addendum Number 2

DIRECTORS

JOE FITZPATRICK
1ST DISTRICT

NELLO BIANCO
2ND DISTRICT

SUE HONE
3RD DISTRICT

MARGARET K. PRYOR
4TH DISTRICT

ERLENE DeMARCUS
5TH DISTRICT

JOHN GLENN
6TH DISTRICT

WILFRED T. USSERY
7TH DISTRICT

JAMES FANG
8TH DISTRICT

MICHAEL BERNICK
9TH DISTRICT

To All Prospective Proposers :

1. The Contract Book is hereby changed in accordance with the attached documentation concerning both technical and administrative requirements.
2. The Contract Proposal due date will remain at November 5, 1991 at 2:00 P.M.
3. All other terms and conditions of the Contract Book remain unchanged.

Very truly yours,

A handwritten signature in dark ink, appearing to read "Frank J. Wilson", is written over a horizontal line.

Frank J. Wilson
General Manager



BAY AREA RAPID TRANSIT DISTRICT
800 Madison Street - Lake Merritt Station
P.O. Box 12688
Oakland, CA 94604-2688
Telephone (415) 464-6000

October 25, 1991

ERLENE DeMARCUS
PRESIDENT

MICHAEL BERNICK
VICE-PRESIDENT

FRANK J. WILSON
GENERAL MANAGER

**Subject: Contract Number 42DA-110
Procurement of Transit Vehicles
Addendum Number 5**

DIRECTORS

JOE FITZPATRICK
1ST DISTRICT

NELLO BIANCO
2ND DISTRICT

SUE HONE
3RD DISTRICT

MARGARET K. PRYOR
4TH DISTRICT

ERLENE DeMARCUS
5TH DISTRICT

JOHN GLENN
6TH DISTRICT

WILFRED T. USSERY
7TH DISTRICT

JAMES FANG
8TH DISTRICT

MICHAEL BERNICK
9TH DISTRICT

To all Prospective Proposers:

1. The Contract Book is hereby changed in accordance with the attached documentation concerning the Contract Proposal due date which has been changed to November 26, 1991 at 2:00 p.m.
2. All other terms and conditions of the Contract Book remain unchanged.

Very truly yours,

A handwritten signature in dark ink, appearing to read "Frank J. Wilson", written over a horizontal line.

Frank J. Wilson
General Manager

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BAY AREA RAPID TRANSIT DISTRICT
800 Madison Street - Lake Merritt Station
P.O. Box 12688
Oakland, CA 94604-2688
Telephone (510) 464-6000

November 18, 1991

ERLENE DeMARCUS
PRESIDENT

MICHAEL BERNICK
VICE-PRESIDENT

FRANK J. WILSON
GENERAL MANAGER

Subject: Contract Number 42DA-110
Procurement of Transit Vehicles
Addendum Number 6

DIRECTORS

JOE FITZPATRICK
1ST DISTRICT

NELLO BIANCO
2ND DISTRICT

SUE HONE
3RD DISTRICT

MARGARET K. PRYOR
4TH DISTRICT

ERLENE DeMARCUS
5TH DISTRICT

JOHN GLENN
6TH DISTRICT

WILFRED T. USSERY
7TH DISTRICT

JAMES FANG
8TH DISTRICT

MICHAEL BERNICK
9TH DISTRICT

To All Prospective Proposers :

1. The Contract Book is hereby changed in accordance with the attached documentation concerning the Contract Proposal due date which has been changed to December 10, 1991 at 2:00 P.M.
2. All other terms and conditions of the Contract Book remain unchanged.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Frank J. Wilson".

Frank J. Wilson *for*
General Manager

EXHIBIT “H”



EXECUTIVE DECISION DOCUMENT

GENERAL MANAGER APPROVAL:

GENERAL MANAGER ACTION REQ'D:

Approve and forward to Board

NARRATIVE:

PURPOSE: To obtain Board's approval to award the transit vehicle procurement Contract 42DA-110 to Morrison-Knudsen.

BACKGROUND:

In July, 1991, the Board by a two-thirds vote authorized the General Manager to procure transit vehicles by competitive negotiation under Public Contract Code, Section 20229.1. The award of the contract is subject to Board approval.

The negotiated procurement process generally includes the following stages: Request for proposals (RFP), evaluation of proposals for compliance with the requirements, ranking of the proposals, determination of proposals that are in competitive range, competitive discussions, refinement of requirements, best and final offers, evaluation of best and final offers, and recommendation of award.

The RFP was advertised on August 1, 1991 and proposals were received from Morrison-Knudsen, C.Itoh/Kinki-Sharyo, and Mitsui/Kawasaki on December 10, 1991. Technical proposals were evaluated by a technical evaluation committee and price proposals were evaluated by a separate price evaluation committee. Proposals with financing were evaluated separately from proposals without financing. The evaluation of proposals (Round 1) was completed December 30, 1991.

Clarification meetings were held with all proposers from January 20 to January 25, 1992. Written responses were also provided by all proposers in response to the District's questions for clarification. Re-evaluation of the proposals based on discussions and written responses were completed (Round 2) on January 28, 1992.

Second round of discussions and negotiations were held with all proposers from February 10 to February 15, 1992. As a result of this set of meetings, the District revised the contract requirements and a request for best and final offer (BAFO) was mailed to the proposers on February 20, 1992.

Best and final offers were received on March 2, 1992 and both the technical and price evaluations were completed the same day (Round 3). The two Committees were advised by the District's Office of the General Counsel and outside consultants.

Staff completed the evaluation of best and final offers (BAFO) and determined that Morrison-Knudsen ranks the highest.

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ROUTING NO.	PERSON	DUE DATE	INITIAL	DATE	PROPOSAL AFFECTS (CHECK ALL THAT APPLY):	COORDINATION TO COMPLETE ACTION (X IF APPROVALS REQUIRED):
1.	Richard A. White		RAW	3/16	OPERATING BUDGET	<input checked="" type="checkbox"/> AGM OPERATIONS
2.					CAPITAL BUDGET	<input checked="" type="checkbox"/> HUMAN RELATIONS AND SUPPORT SERVICES
3.					CAPITAL PROGRAMS	<input checked="" type="checkbox"/> DISTRICT RELATIONS AND SUPPORT SERVICES
4.					GOVERNMENT RELATIONS	<input checked="" type="checkbox"/> GENERAL COUNSEL
5.					LABOR RELATIONS	<input checked="" type="checkbox"/> CONTROLLER TREASURER
6.					AFFIRMATIVE ACTION	<input type="checkbox"/> SAFETY AND INVESTIGATIONS
7.					SAFETY	<input type="checkbox"/> PUBLIC INFO
8.					LEGAL	<input type="checkbox"/> PROCUREMENT
9.						<input type="checkbox"/> STAFFING
10.						<input type="checkbox"/> CONSULTANTS
						<input type="checkbox"/> OTHER

PREPARED BY: Kris Hari
INITIALS: [Signature]
DATE: 3/16/92

EXECUTIVE DECISION DOCUMENT

NARRATIVE CONTINUED:

Based on the need for transit vehicles to support extensions, patronage growth in the existing system and rehabilitation of A and B cars, and due to significant pricing advantage, 80 transit vehicles are recommended to be procured under this contract. Any options recommended to be exercised will be brought to the Board for approval.

SCHEDULE:

Eighty (80) vehicles are scheduled to be delivered by December, 1995. The delivery of all option vehicles, if exercised, will be completed by September, 1997.

DBE PARTICIPATION/DOMESTIC CONTENT/ANTI-APARTHEID CERTIFICATE

The domestic content (Buy America) is 79 percent of the total contract. The DBE percentage is 21 percent of the domestic content of the total contract. Morrison-Knudsen has certified that it is in compliance with the Comprehensive Anti-Apartheid Act of 1986

FUNDING:

The bid price for the procurement of 80 cars is approximately \$1.6 million per car, plus costs for other items such as engineering, tooling and testing; spare parts; special test equipment; publications and manuals, etc., resulting in a total bid price of \$141,600,052.

Funding for the procurement of 50 of these vehicles is programmed from approved funding sources for the blin/Pleasanton and West Pittsburgh Extensions Programs. These sources are expected to be available to meet contractual payment schedules. Funding for the procurement of the remaining 30 vehicles will be accomplished through either future capital grants or District operating funds. The possible capital funding sources for the 30 cars include the Warm Springs Extension Program, the San Francisco Airport Extension Program, or the A/B Car Rehabilitation Program. The amount of procurement funding currently not specifically identified for the 30 cars is approximately \$73 million, including financing costs. Should the previously identified or other capital funding sources not be available when the final car is delivered in late calendar year 1995, BART would be required to secure a financing instrument for \$73 million which will pledge BART operating revenues. Should this amount be financed over a 20 year basis, it is estimated that approximately \$7 million of BART's operating monies per year would be required to debt service this financing instrument. Details of any financing plan must be satisfactory to the Controller-Treasurer and the General Manager and approved as to form by the Office of the General Counsel before submission to the Board for approval.

It may be advantageous to the District to finance the construction costs of 80 cars on a short-term basis (May 1992 - January 1996). The estimated cost of such short-term financing in the amount of \$9,580,000 is included in the budget.

The total budget for the procurement is estimated to be as follows:

Procurement	\$141,600,052
Support Cost	25,500,000
(Sales Tax, Project Management, Contingency)	
Escalation	18,319,948
Financing	9,580,000
	<u>\$195,000,000</u>

EXECUTIVE DECISION DOCUMENT
NARRATIVE CONTINUED:

ALTERNATIVES:

Additional transit vehicles are needed in support of extensions, patronage growth in the existing system, and rehabilitation of A and B Cars. If these vehicles are not procured, load factors may reach unacceptable levels and the quality of service cannot be maintained. This alternative is not recommended. Also, to purchase 30 additional cars as an option rather than as part of the base contract would result in higher cost in the amount of approximately \$14.4 million, which is also not recommended.

RECOMMENDATION:

It is recommended that Contract No. 42DA-110, Procurement of Transit Vehicles, be awarded to Morrison-Knudsen, at a cost of \$141,600,052, exclusive of sales tax.

MOTION:

The General Manager is authorized to award Contract No. 42DA-110 to Morrison-Knudsen for the purchase of 80 transit vehicles for the bid price of \$141,600,050, exclusive of Sales Tax and other project costs, and subject to compliance with the protest procedures in the Contract Book. The General Manager is directed to report to the board periodically regarding funding and financing methods for the 30 additional cars in the base order, and to obtain approval of the initial and any subsequent changes to such funding/financing plans.

EXHIBIT “I”



BAY AREA RAPID TRANSIT DISTRICT
800 Madison Street - Lake Merritt Station
P.O. Box 12688
Oakland, CA 94604-2688
Telephone (510) 464-6000

P

February 20, 1992

WILFRED T. USSERY
PRESIDENT

NELLO BIANCO
VICE-PRESIDENT

FRANK J. WILSON
GENERAL MANAGER

Mr. Thomas J. Smith, President
Morrison Knudsen Corporation
Horton Street
Hornell, NY 14843

Subject: Request for Best and Final Offer
Contract No. 42DA-110

DIRECTORS

JOE FITZPATRICK
1ST DISTRICT

NELLO BIANCO
2ND DISTRICT

SUE HONE
3RD DISTRICT

MARGARET K. PRYOR
4TH DISTRICT

ERLENE DeMARCUS
5TH DISTRICT

JOHN GLENN
6TH DISTRICT

WILFRED T. USSERY
7TH DISTRICT

JAMES FANG
8TH DISTRICT

MICHAEL BERNICK
9TH DISTRICT

Dear Mr. Smith:

The Bay Area Rapid Transit District invites your firm to submit its Best and Final Offer (BAFO) to the subject contract. The District reviewed responses to our letter of January 31 during meetings of February 10 and 11. Responses and written clarifications submitted during the meeting are considered to be modifications to your technical proposal. Details of the BAFO submittal are described below.

Modified Contract

The attached changes to the specification represent the final set of BART requirements for which a BAFO is requested. Your BAFO must be fully compliant with these requirements in order to be considered responsive. As you know, we discussed many of these changes at our recent meeting.

A general summary of changes incorporated in the BAFO document are as follows:

- preventive maintenance by carbuilder removed
- warranty shortened from three to two years
- manuals to be updated by change pages
- CAD format drawings and/or mylars are permitted
- special test equipment only required for alternate subsystems

Mr. Thomas J. Smith

2/20/92

Page 2

- word processing medium only for revised pages and alternate subsystems
- car fault monitor deleted
- compression, hoisting, and jacking tests deleted
- reduction of spare parts requirements
- crashworthiness test deleted
- composite test deleted
- maintainability test deleted
- Reliability demonstration test changes include modifications to the intermediate reliability requirements and the individual subsystems reliability requirements. The test duration has been dropped from 200,000 hours to 100,000 hours. In addition, the requirements for documentation have been substantially reduced. The intermediate reliability requirements are tied to payment mile-stones.
- The District has offered a vehicle to the successful bidder for mock up and any other engineering activities required
- Various changes to terms and conditions

The specification changes have been made by shaded area (additions) and strike out (deletions) as requested by all proposers.

Mr. Thomas J. Smith
2/20/92
Page 3

BAFO Submission

The submission for BAFO requires you to submit offers for base buys of 50 and 80 cars with options as described in the contract documents. Your best and final offer must be received by the District Secretary no later than 2 PM on Monday, March 2, 1992. The proposers are responsible for their proposals being received by the District Secretary at the address indicated, and, for hand delivery, by the time indicated. Delivery may be made as follows:

Hand Delivery:

District Secretary
BART Administration Building
800 Madison Street
Oakland, CA. 94607

U.S. Mail:

District Secretary
BART Administration Building
800 Madison Street
P.O. Box 12688
Oakland, CA. 94604-2688

To be compliant, your best and final offer must comprise of a fully completed set of proposal forms as described in article P2.04 of the Contract Book. Proposers are encouraged to submit any finance proposals or clarifications not submitted during, or as a consequence of, the proposers meetings.

If a financing proposal is made, it must apply to a base buy of either 50 or 80 cars. In addition, the request for best and final offer requires the following:

- Analysis of DBE content (ref. pages 20 and 21 of proposal forms)
- Analysis of local content (ref. page 22 of proposal forms)
- An account of increases in local content beyond your BAFO submission that might be obtained as an optional BART decision with discrete impacts on cost, schedule, or risk (ref. page 22 of proposal forms).
- Projected Buy America content

Mr. Thomas J. Smith
2/20/ 92
Page 4

The acceptable alternate subsystems are included in Attachment 1. No new alternate subsystems will be considered at this stage beyond those listed in Attachment 1. Please note that the District's acceptance of an alternate does not relieve the selected suppliers from complying with all technical and commercial obligations required in the Contract.

Finally, proposers are advised to carefully review their existing bid bond to ensure that it covers at least ten percent of their new proposed price for the higher 80 car base bid alternative. If the existing bid bond is inadequate, proposers should provide a new bid bond and separately request release of their original bid bond.

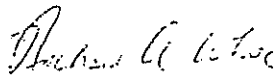
Price Evaluation

It has become clear to the District that some premium pricing has occurred. The District believes that the major technical and commercial price drivers have been addressed during meetings, and necessary changes to the specification have been made. We anticipate that final prices will adequately reflect these changes.

It is our understanding that you are interested in providing price benefits under this procurement should you be the successful lowest bidder for BART contract 93YF-150. Any such price benefit should be identified in your cover letter to your best and final offer.

The District is pleased with your continued participation in the negotiation and looks forward to receiving your best and final offer.

Very truly yours,



Richard A. White
Deputy General Manager

Enclosures: 1) Attachment I – Acceptable Alternate Subsuppliers
2) Request for Best and Final Offer

ATTACHMENT #1

MORRISON-KNUDSEN CORPORATION

<u>Subsystem</u>	<u>Acceptable Alternate Subsuppliers</u>
Carbody:	Alusuisse-Lonzo LHB Utilizing Alsthom Technology
Seats	Fiber Engineering
Doors	Morton
Door Controls	Morrison-Knudsen
HVAC	Thermo King, Transit-Air Sigma
APSE	ABB
Trucks	Atchinson Castings
	AAI - Using Alsthom Technology

EXHIBIT “J”



BAY AREA RAPID TRANSIT DISTRICT
800 Madison Street - Lake Merritt Station
P.O. Box 12688
Oakland, CA 94604-2688
Telephone (510) 464-6000

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

March 18, 1992

TO ALL BIDDERS (List Attached)

WILFRED T. USSERY
PRESIDENT

NELLO BIANCO
VICE-PRESIDENT

FRANK J. WILSON
GENERAL MANAGER

Subject: Contract No. 42DA-110
Procurement of Transit Vehicles

Ladies and Gentlemen:

DIRECTORS

JOE FITZPATRICK
1ST DISTRICT

NELLO BIANCO
2ND DISTRICT

SUE HONE
3RD DISTRICT

MARGARET K. PRYOR
4TH DISTRICT

ERLENE DeMARCUS
5TH DISTRICT

JOHN GLENN
6TH DISTRICT

WILFRED T. USSERY
7TH DISTRICT

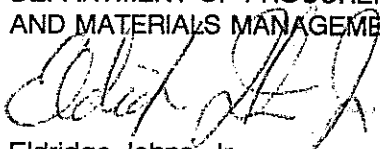
JAMES FANG
8TH DISTRICT

MICHAEL BERNICK
9TH DISTRICT

This is to advise you that at the Board meeting held on March 17, 1992, the District Board of Directors authorized the General Manager to award the referenced contract to Morrison Knudsen Corporation, subject to compliance with the protest procedures in the Contract Book.

Very truly yours,

DEPARTMENT OF PROCUREMENT
AND MATERIALS MANAGEMENT


Eldridge Johns, Jr.
Contract Manager

cc: R. White
M. McDole
K. Hari
A. Pegram
P. Ormsbee
J. Vickland

bcc: W. Thomas

203\42DA110.AWD

0848

Member Mitsui Corporation
Rail Systems Group
Horton Street
Hornell NY 14843

C. Itoh & Company (America), Inc.
335 Madison Avenue
New York NY 10017

Mitsui & Company (USA), Inc.
Machinery Department
1 California Street, Suite 3000
San Francisco CA 94111-5467

EXHIBIT “K”

Contract

1 of 4

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

CONTRACT

THIS AGREEMENT (Contract), for the procurement of Transit Vehicles, Contract No. 42DA-110, is made and entered into this 4th. day of May, 1992, between the San Francisco Bay Area Rapid Transit District (District) and Morrison Knudsen Corporation (Supplier).

ARTICLE I - In consideration of the payments and agreements hereinafter set forth to be made and performed by District and Supplier, and under the conditions expressed in the bond of even date herewith and attached hereto, Supplier agrees with District, at its own cost and expense, to do all the work and furnish all the materials (except those expressly stated in the Contract Documents to be furnished by District) necessary for the completion of the Work in a good, workmanlike and substantial manner and to the satisfaction of the District, in accordance with the Contract Documents attached hereto, the documents identified in Attachment I hereto and the Notice of Award issued by the District. The documents identified in Attachment I hereto are collectively referred to herein as "Supplier's Proposal." The Contract Documents, Supplier's Proposal, and the Notice of Award are by this reference expressly incorporated herein and made a part hereof. In the event of conflict between the Contract Documents and Supplier's Proposal, the Contract Documents shall govern. All capitalized terms used but not defined in this Contract shall have the meanings ascribed to them in the Contract Documents.

ARTICLE II - Supplier agrees to accept the prices set forth in Supplier's best and final offer to the District for the above-described procurement dated February 28, 1992, adjusted as indicated in the Contract Documents, as full compensation for furnishing all materials and for doing all the Work contemplated and embraced in this Contract, for all risks of every description connected with this Contract, and for well and faithfully completing the Work according to the Contract Documents, Supplier's Proposal and the requirements of the District under them.

0853

2 of 4

Contract

ARTICLE III - Supplier hereby promises and agrees with District to provide the materials and to do the Work according to the terms and conditions herein contained and referred to, for the prices aforesaid, and District contracts to pay for the same at the time, in the manner and upon the conditions as above set forth; and the said parties for themselves, their heirs, executors, administrators, successors and assigns do hereby agree to the full performance of all of the covenants and conditions herein contained.

ARTICLE IV - The parties agree that the District shall have the right at it's sole discretion to implement the Supplier Credit option included as a part of it's best and final offer dated February 28, 1992. Additionally, the parties agree that the District shall have the right to utilize the services of Morrison Knudsen's finance team to identify alternative funds and revenue sources to amortize debt as proposed at the meeting held on February 10-11, 1992, and as recorded in the minutes of said meeting which are incorporated herein as part of Supplier's Proposal.

ARTICLE V - Supplier hereby agrees to furnish transit vehicles in accordance with the options provided in the Contract Documents if such options are exercised by the District, with compensation by the District as indicated in the Contract Documents.

IN WITNESS WHEREOF, the parties have hereunto executed this Contract as of the date first above written.

DISTRICT:

/S/ Wilfred T. Ussery
 /S/ Nello Bianco
 /S/ Michael Bernick

SAN FRANCISCO BAY AREA
 RAPID TRANSIT DISTRICT

By: Frank J. Wilson
 General Manager

SUPPLIER:

MORRISON KNUDSEN CORPORATION

By: Thomas J. Smith
 Title

By: _____
 Title

0854

CONFORMED

CONTRACT
 42DA-110
 920506

Contract

3 of 4

ATTACHMENT I
SUPPLIER'S PROPOSAL

- A. M-K Technical Proposal submitted 12/10/91
M-K Price Proposal submitted 12/10/91
- B. BART letter to M-K dated 1/6/92
Round 1 proposal review comments and proposer meeting agenda
- C. M-K letter to BART dated 1/15/92
Response to comments and supplemental information
- D. M-K letter to BART dated 1/20/92
Request for MDBF on BART C-cars
- E. Round 1 Proposer Meeting Minutes dated 1/20 & 1/21/92
BART letter to M-K dated 1/23/92
Round 1 Proposer Meeting draft action items
- G. M-K letter to BART dated 1/29/92
Confirmation of Round 1 Proposer meeting draft action items
- H. BART Letter to M-K dated 1/31/92
Round 1 Proposer Meeting final action items
- I. M-K letter to BART dated 2/3/92
Request for additional MDBF data on BART C-cars
- J. BART letter to M-K dated 2/5/92
MDBF data on BART C-cars
- K. BART letter to M-K dated 2/5/92
Round 2 Proposer Meeting notice
- L. M-K letter to BART dated 2/8/92
Response and information to Round 1 Action items
- M. BART letter to M-K dated 2/10/92
Draft BAFO package to M-K
- N. Round 2 Proposer Meeting minutes dated 2/10 & 2/11/92
- O. M-K letter to BART dated 2/18/92
Supplemental information to Round 2 action items

4 of 4

Contract

- P. BART letter to M-K dated 2/20/92
BAFO request to M-K
- Q. BART letter to M-K dated 2/27/92
BAFO request modification No. 2
- R. BART letter to M-K dated 2/27/92
Clarifications to BAFO request
- S. M-K BAFO Technical Proposal dated 2/28/92, submitted 3/2/92
M-K BAFO Price Proposal dated 2/28/92, submitted 3/2/92

0856

CONFORMED

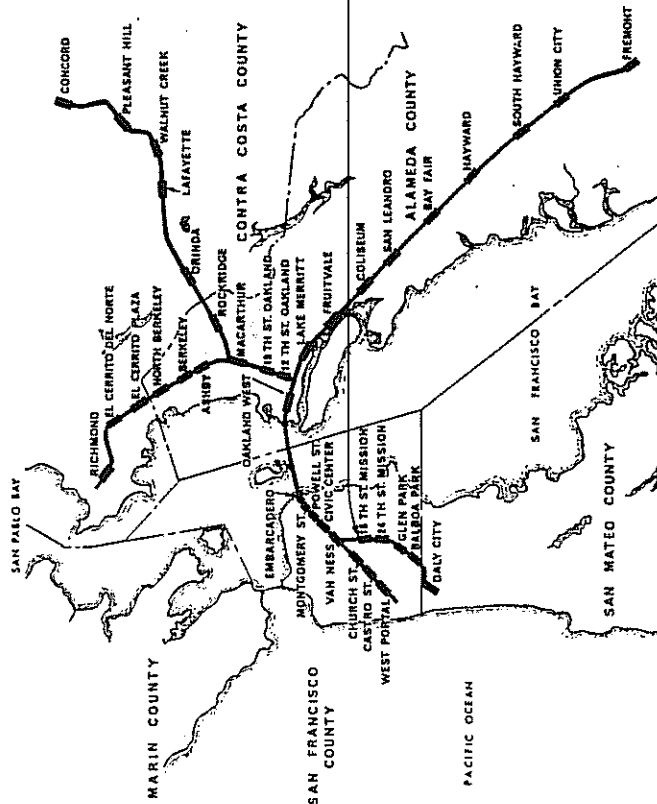
CONTRACT
42DA-110
920506

EXHIBIT “L”

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

Plan for Construction of

16TH STREET MISSION STATION FINISH SAN FRANCISCO MISSION LINE



KEY PLAN

Graphic Scale
0 1 2 3 4 5 6 7 8 9 10 MILES

SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT

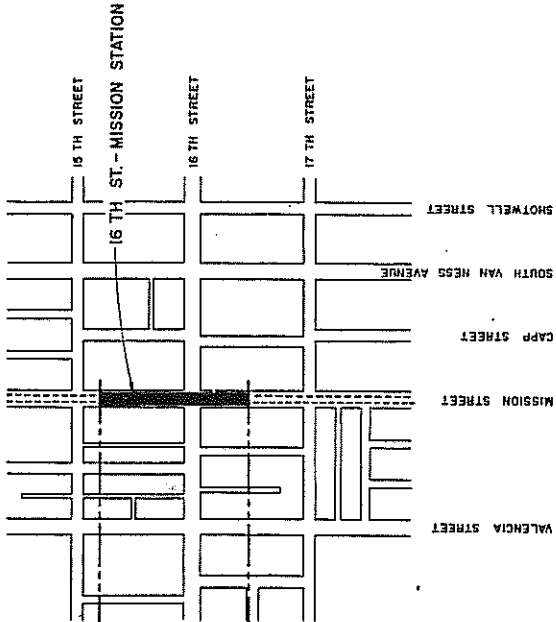
APPROVED: *[Signature]* DATE: 02/14/08

SECTION OF DISTRICT AND OPERATIONS

PARSONS BRINCKERHOFF-TUDOR-RECHTEL
GENERAL ENGINEERING CONSULTANTS

TUDOR ENGINEERING COMPANY
PROJECT MANAGER

APPROVED: *[Signature]* DATE: 02/14/08
PROJECT DIRECTOR



GENERAL CONSTRUCTION SITE PLAN

Graphic Scale
0 300 600 900 1200 1500 FEET

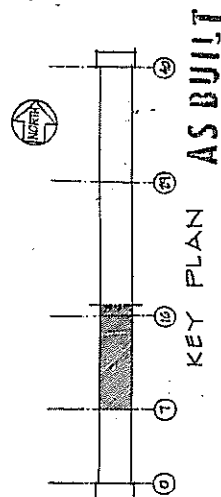
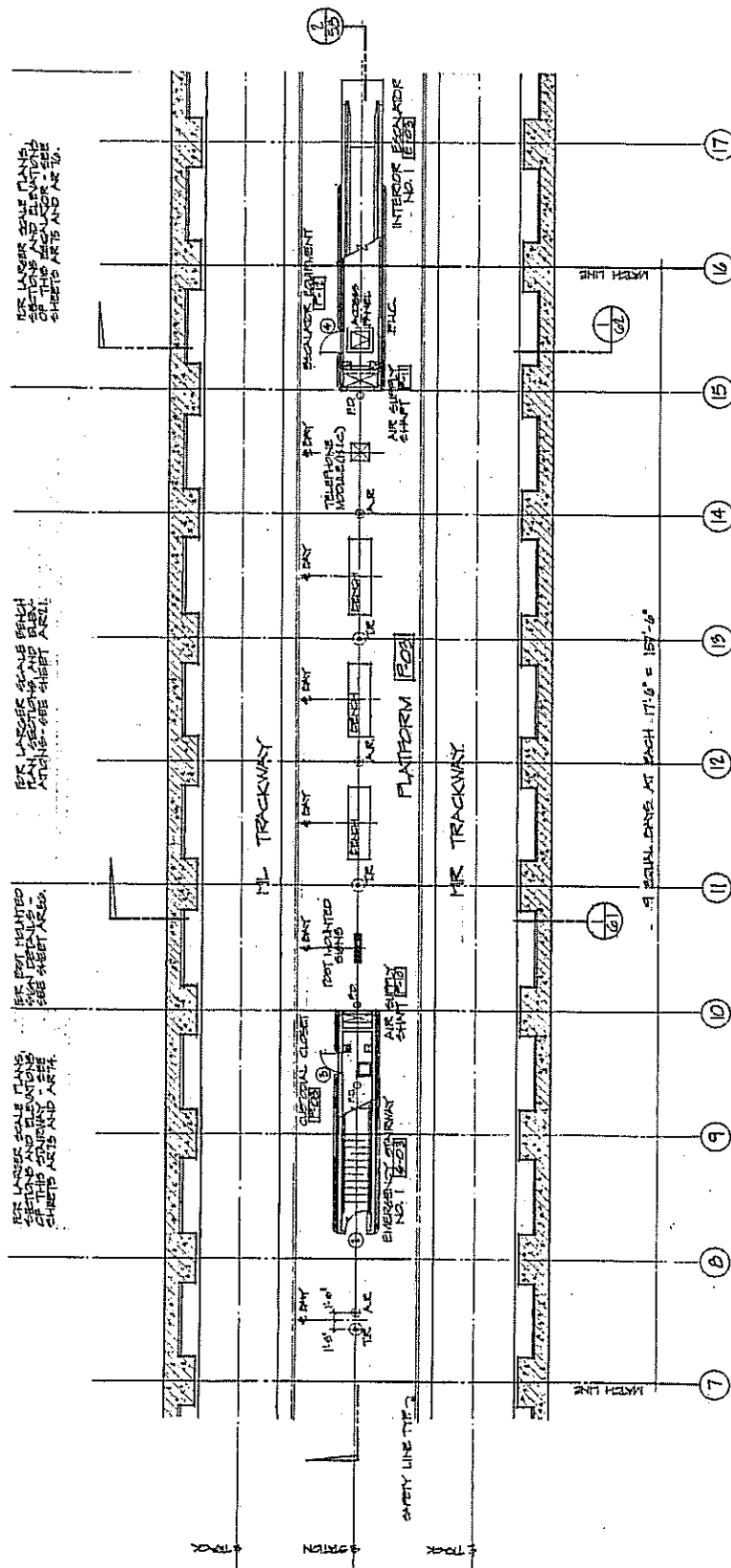
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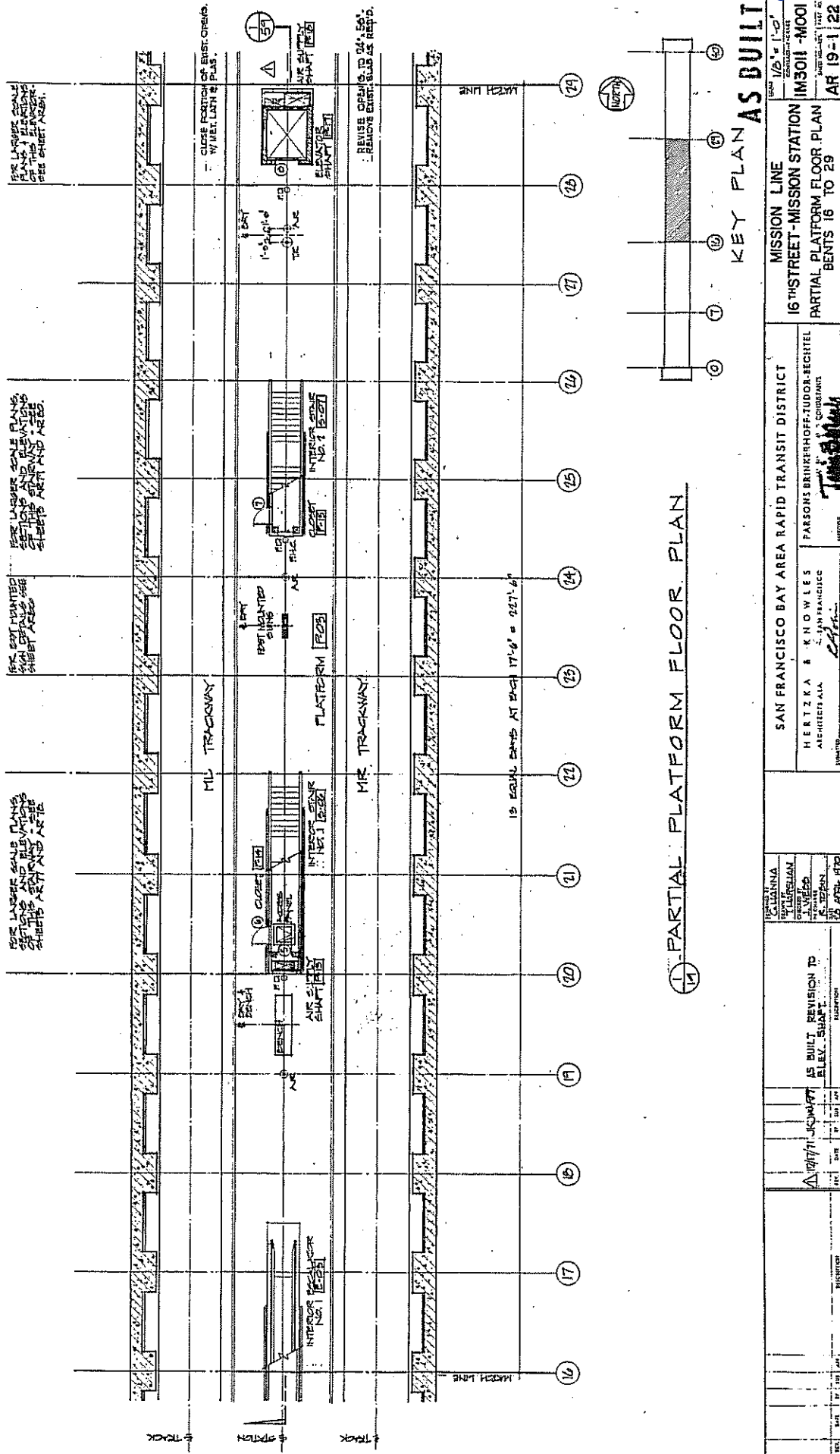
⑤ Y E Y P L A N ⑥ A S B U I T ⑦

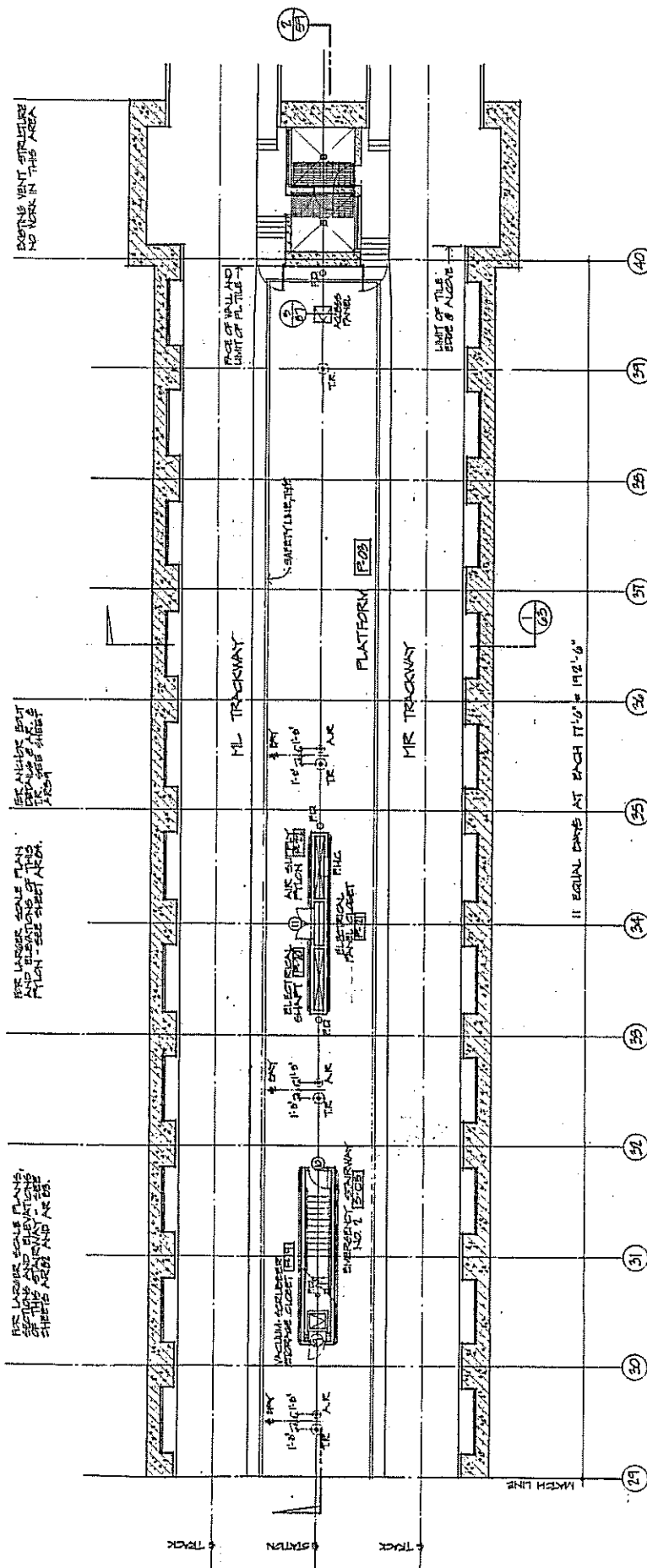
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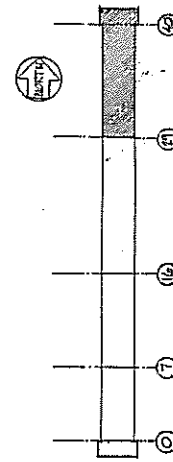
① PARTIAL PLATFORM FLOOR PLAN

<p>MISSION LINE</p>	<p>16TH STREET - MISSION STATION</p>	<p>PARTIAL PLATFORM FLOOR PLAN</p>	<p>BENTS 7 TO 17</p>
<p>SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT</p>	<p>HERTZKA & KNOWLES</p>	<p>PARSONS BRINCKERHOFF-TUDOR-BECHTEL</p>	<p>ARCHITECTS</p>
<p>DATE: 1/15/08</p>	<p>SCALE: 1/8" = 1'-0"</p>	<p>PROJECT: 16TH STREET - MISSION STATION</p>	<p>AR 18-9121</p>





PARTIAL PLATFORM FLOOR PLAN



KEY PLAN ASBUILT

MISSION LINE
STREET MISSION STATION
PLATFORM FLOOR PLAN
BENTS 29 TO 40

HERTZKA & KNOWLES ARCHITECTS, S.F. <i>Boyle</i>	SAN FRANCISCO BAY AREA RAPID TRANSIT DISTRICT PARSONS BRINCKERHOFF-TUDOR-RECHTEL "P.B.T.R." CONSULTANTS <i>Tudor</i>
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2444435 17
 GILIANA
 WILLIAM
 ORDER BY
 J. WOOD
 IN CHARGE
 K. TOWN
 DATE
 05 APRIL 1970

DISCONTINUOUS

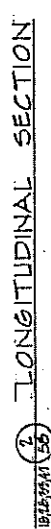
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JAN 10 1964

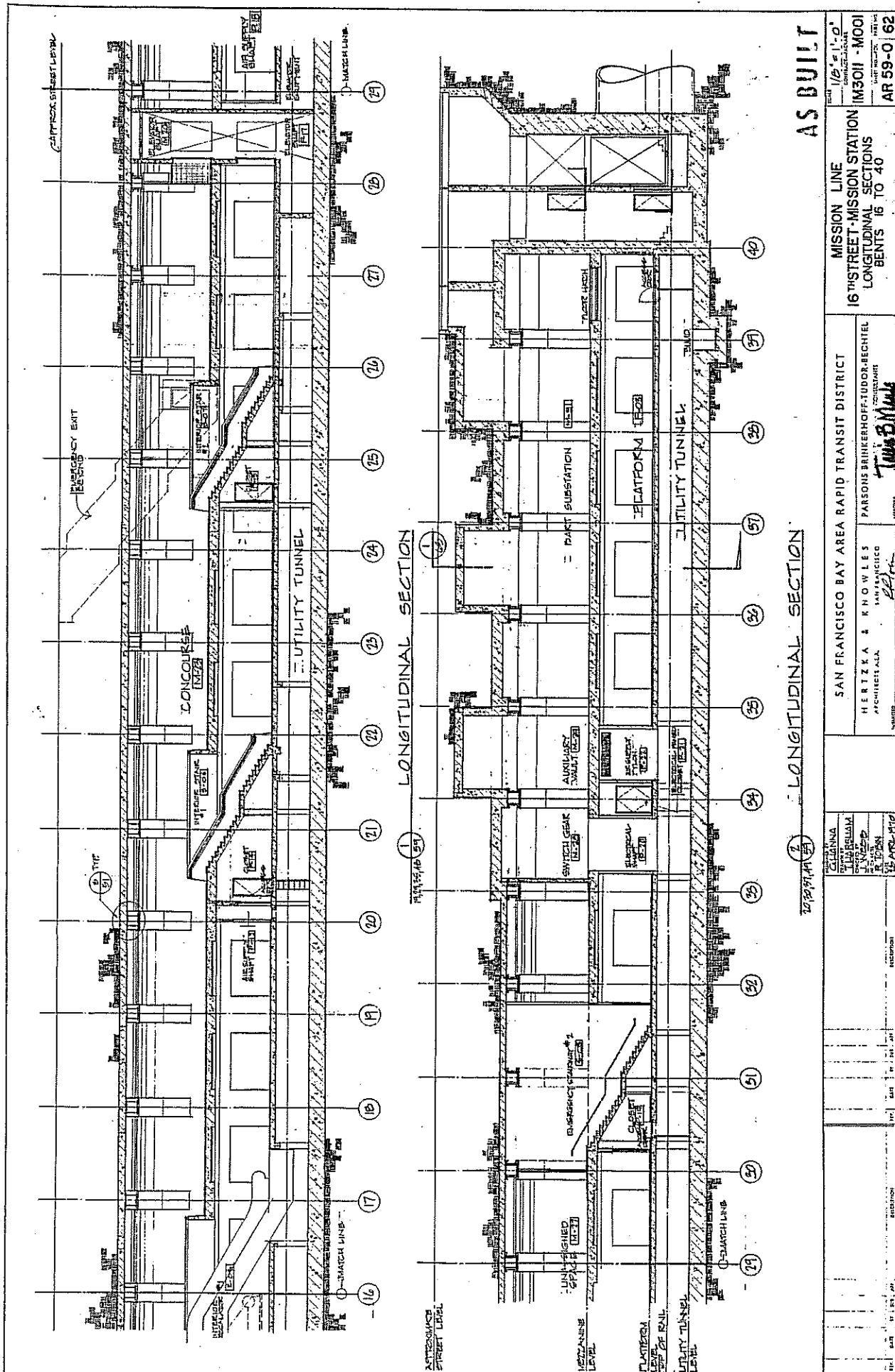
Concentration of inhibitor (mole/l)	Rate of polymerization (mole/l·hr)
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0.0001	0.0004
0.0002	0.0002
0.0005	0.0001
0.001	0.0001

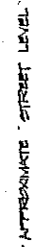
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RESULTS

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TRANSVERSE SECTION
BETWEEN BENTS 15 & 16

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